GRAIN MARKETING FACILITIES AND PRACTICES in South Carolina

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CONTENTS

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SUMMARY

Few storage facilities suitable for the storage and care of grains and soybeans, which use the same facilities and equipment for marketing as small grains, were found on farms in South Carolina. Small grains, mainly in bags, and bulk ear corn were stored in all types of facilities under conditions conducive to serious insect and moisture damage.

About 30 percent of the commercial feeds bought by farmers in South Carolina during the year starting July 1, 1952 were processed within the State, and 70 percent were processed by companies outside the State. In 1952, farmers in South Carolina purchased feed that was equivalent in nutrient values to 10 million bushels of corn.

Of the 86 grain buyers visited, 23 had facilities that were considered to be reasonably good for receiving, handling, and storing grain, 53 had facilities considered poor to worthless, and 10 were truckers who had no permanent grain marketing facilities. Buyers with good facilities bought about two-thirds of all the grain purchased, but the distribution of these facilities was not uniform over the State. Buyers who processed all the grains they bought purchased more than half of all the grains sold by farmers from their 1952 crops.

The most serious defects in the grain marketing system in South Carolina in 1954 were (1) lack of good storage facilities and practices on farms, (2) use of large amounts of labor in harvesting and marketing small grains, (3) lack of efficient off-farm facilities for receiving, handling, and storing grains at low cost, for preserving quality, and for rendering good service to farmers, (4) lack of accurate methods for determining at elevators the quality and grade of the grain, for use in establishing equitable prices, and (5) lack of accurate methods for determining at elevators the quantity of corn (shelled basis) in a lot of ear corn.

Major improvements needed to bring about an efficient grain marketing system are (1) the use of bulk handling attachments on grain combines, to eliminate the handling and storage of small grain in bags, (2) the harvesting of small grains when the moisture content is low enough to eliminate spoiling in storage, and (3) the construction or acquisition of suitable farm grain-storage structures so that grains can be fumigated effectively for insect infestation and can be air-dried.

Additional good storage space was needed on farms in 1953 for about 36 million bushels of grains remaining on farms 1 month or longer. Good storage space for about half a million bushels was needed in off-farm facilities to replace poor storage space used in 1953. Major improvements were needed in off-farm facilities in 12 counties, and minor improvements in 20 counties. In 13 counties, the quantity of grains moving from farms or the location of good elevators in adjacent counties would make new grain handling facilities financially hazardous. In one county, a new low-cost elevator for receiving, handling, and shipping grain seemed to be reasonably feasible.

In the long run, farmers wishing to participate in CCC grain-storage loan programs would probably find it advantageous to provide the storage facilities so badly needed for storing both the grain used on farms and the grain eventually sold, and to obtain on-farm storage loans on their grains.

An efficient elevator for assembling grain from farms and shipping it out can be built at a relatively low cost, with the principal cost being the equipment necessary to receive, handle, and load out grain. An elevator for storing grain for an extended period of time must have a large storage capacity, estimated to be a minimum of 400,000 to

500,000 bushels if storage is to be the principal source of income, to pay for the cost of operation and to amortize the investment.

A grain elevator in South Carolina can probably be most successful if it is operated in conjunction with other enterprises, such as cotton ginning and feed grinding and mixing. The cost of labor and management in running an elevator may be more than half the cost of operation, and greater use of labor can result from multiple enterprises.

Good storage space to store the 36 million bushels of grain now being stored on farms in poor facilities for 1 month or longer would cost about $10.8 million. The benefits from preventing insect damage to this grain would probably be about $3.3 million a year. An estimated $525,000 could be saved in the cost of bags each year by eliminating the bagging of grain, and an additional saving would be made in farm labor by bulk handling.

Farmers who produced and sold about 10 million bushels of grains from the 1952 crops would be financially able to hold that volume off the market at harvest-time. Price trends in recent years indicate that, if this volume were stored in good farm facilities and sold a few months later, an increase in price of at least 15 cents a bushel probably could be realized. If such an increase in price on the sale of 10 million bushels took place, it would lead to an increase in income of $1.5 million. The additional storage space would cost about $3 million.

Improvements in off-farm receiving, handling, shipping, and storage facilities might eventually permit narrower dealer margins and increased prices to farmers, while still giving reasonable profits to buyers.

GRAIN MARKETING FACILITIES AND PRACTICES IN SOUTH CAROLINA

By Thew D. Johnson, agricultural economist, W. Edward Blackmore and E. W. Siedschlag, marketing specialists, and Perry S. Richey[1]

BACKGROUND OF THE STUDY

This study was made at the request of the Extension Service of Clemson Agricultural College. Its purpose was to obtain and evaluate information relating to (1) the quantity and quality of grains marketed in South Carolina, (2) the types and adequacy of grain-handling facilities, (3) the location of such facilities with respect to grain production and consumption areas, (4) the local grain marketing practices, and (5) recommendations for improving the grain marketing system and handling facilities in the various production and consumption areas in the State.

A field survey of grain-handling facilities was made during the summer of 1953 through personal interviews with all the principal grain buyers and handlers in the State, as well as many small buyers and processors. Observations were made as to the numbers, sizes, and types of grain-handling facilities, their location in relation to production and consumption areas, and the marketing practices and local customs followed in the receiving, handling, care, and shipping of whole grain. Information was furnished by local grain handlers as to the quantity of each grain of the 1952 crop that was bought from farmers, from local dealers, and from other sources, and the utilization made of each type of grain that was bought.

In addition to the information supplied by the grain handlers, data concerning grain production and marketing were secured from the State Crop Reporting Service, county agricultural extension agents, and officials of the State and County Agricultural Stabilization and Conservation Committees. Additional data relating to harvesting practices, grain handling on farms, and methods of marketing grains were obtained by each county agricultural extension agent through personal interviews of a number of farmers in each county in the State. Details of this supplementary study are included in a report entitled, "Production, Harvesting, and Marketing of Grains on Individual Farms in South Carolina," published by the Extension Service of Clemson Agricultural College.

AGRICULTURAL AREAS

The three major physiographic areas in the State are the Piedmont Plateau, the Coastal Plains, and the Sandhills in between. For purposes of this study, the Piedmont and Coastal Plains areas are further divided, giving five areas referred to as the Upper Piedmont, Lower Piedmont, Sandhills, Upper Coastal Plains, and Lower Coastal Plains. Each of these five areas has somewhat different characteristics with respect to soil types, climate, rainfall, and other factors affecting its adaptability to the production of each of the grain crops and soybeans.

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GRAIN CROPS IN SOUTH CAROLINA AGRICULTURE

In years of normal growing weather, the value of grain production in South Carolina has been about $70 million. Corn, oats, wheat, and soybeans have used from 50 to 55 percent of the cropland harvested in the State in recent years. But, from the standpoint of direct cash farm income, the sale of grains is a minor enterprise. Cotton and tobacco are the major cash crops. Corn and oats, the principal grain crops, are grown on most farms for livestock feed.

Production of Grains

CORN

Corn is grown on a high percentage of the farms. Heaviest corn production is found in the Coastal Plains and Sandhills areas which produce about three-fourths of the State production.

Corn acreage has decreased moderately in recent years, but the average yields per acre have steadily increased in years of reasonably adequate rainfall, resulting in increases in production (fig. 1). The principal reasons for the increases in yields per acre

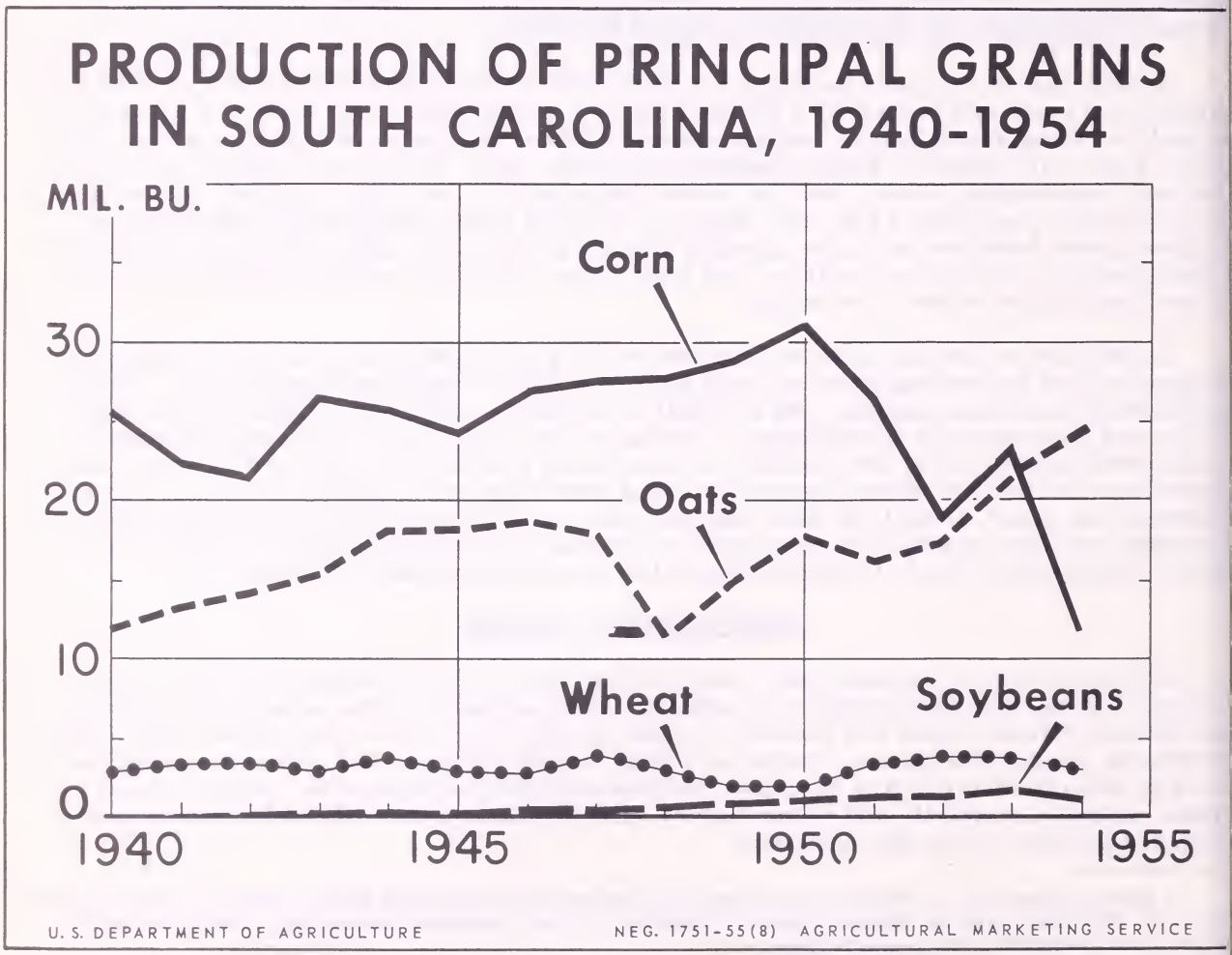

Figure 1.--Production of corn, oats, wheat, and soybeans in South Carolina, 1940-54.

have been (1) improved and adapted hybrid seed, (2) more productive crop rotations, (3) more liberal application of fertilizers, and (4) more efficient cultural practices. It is quite likely that the yields per acre will continue to increase. Further substantial declines in acreage are not expected. It is probable, therefore, that, with adequate rainfall, total production of corn will increase during the next few years. Estimated corn production in 1952 was 18,945,000 bushels.

OATS

Oats are well adapted to soil and climatic conditions in South Carolina. The quality of oats produced, especially in certain areas, is naturally high, the grain having a relatively heavy weight per bushel and a bright appearance. During the last 50 years the production of oats has steadily increased from about 4 million bushels to 17,460,000 bushels in 1952, and more than 20 million bushels in 1954. This increase in production has been brought about by increases in acreage harvested and yields per acre.

Yields per acre of small grains, which are harvested mainly in June, were not seriously affected by drought in the years 1951, 1952, and 1953. Farmers and grain dealers expressed the opinion, based on experience, that the incidence of drought in the spring affecting small-grain yields was much less pronounced and less frequent than droughts affecting corn growth in June, July, and August. Reports from farmers indicate that oat and wheat crops had never been complete failures on farms reporting, and that the lowest reported yields may have resulted from causes other than lack of rainfall.

Probably one of the chief reasons for the increases in the acreage of oats has been the use of the crop for winter and early spring pasture. Apparently, oats can be grazed without serious decreases in yields of grain per acre if grazing is discontinued before the crop starts to boot. After the oats head out in April and May, a farmer can either cut the crop for hay or harvest it for grain.

In 1953, information obtained from farmers indicated that farms with the greatest numbers of cattle grew the largest acreage of oats, and that most farms with herds of beef cattle sold harvested oats as a cash crop instead of saving it for farm feed. These facts are cited to indicate that the expansion in acreage and production of oats is tied directly into the growth of a diversified farming system and is likely to continue.

WHEAT

Wheat has been the third largest grain crop produced in the State for more than 50 years. Its production is more localized than the production of corn or oats, with most of the crop being produced in the Upper Piedmont area. The total acreage of wheat in the State may change greatly from year to year because of acreage controls on wheat and cotton and because there apparently are many in-and-out growers as well. The acreage of wheat increased from about 50,000 acres in the early 1930's to 300,000 acres in 1942. Since 1942, the acreage has decreased to a level of less than 200,000 acres. The yields per acre have nearly doubled from 10 bushels per acre in the early 1930's to nearly 20 bushels in recent years. Estimated wheat production was 3,680,000 bushels in 1952.

SOYBEANS

Soybean production is most concentrated in the Upper Coastal Plains area. In recent years about 90 percent of total State production has come from this area. Total production of soybeans for beans has been increasing rapidly since 1936, and in some sections soybeans have become an important cash crop. Increased production has come about mainly by increased acreage. With normal rainfall during the summer growing season and with improved varieties and better cultural practices, the production of soybeans seems likely to increase substantially above the 1,127,000 bushels produced in 1952.

Barley, rye, and grain sorghums are produced in small quantities in many areas of the State. In the Piedmont area, barley is often planted for pasture and grain in place of oats. Rye has given good winter grazing in all areas in the State and has produced reasonably good yields on rather poor sandy lands. Grain sorghums have been grown both for forage and for grain because this crop is more drought-resistant than corn. These three grain crops are of minor significance as feed for livestock, except on a few individual farms, and are not significant in off-farm commercial channels.

Harvesting Practices

Most farmers either pulled or slip shucked their corn from the standing stalk. The mechanical cornpicker has been coming into use to a limited extent. It was reported that in some of the Upper Coastal Plains counties a few picker-shellers were being used to pick, husk, and shell the corn in one operation. Except for the shelled corn resulting from this operation, all corn left the field as ear corn with a partial or a complete husk.

Most small grains were harvested by combines, although threshing outfits still operated in a few of the small-grain production areas. About one-sixth of the combines operating in the State in 1953 were equipped to handle grain in bulk; the rest had equipment that required the bagging of threshed grain at the combine. Bulk combines were becoming more popular in the Upper Coastal Plains counties. Farmers having substantial acreages of small grains and soybeans usually owned combines, but it is estimated that more than half the farmers hired combine harvesting from local custom service operators. The use of custom combining by a large number of farmers accounts for the quantity of grain harvested with a relatively high moisture content, because the combine operator cannot afford to limit his combine operations to that part of the day when the grain is driest.

Soybeans are usually harvested with the same type of combines that are used to harvest small grains. However, in these areas and on those farms producing substantial quantities of soybeans, bulk combines are coming into more common use. Soybeans are seldom stored on farms for any length of time and on most farms not at all.

Storage Facilities Available on Farms

It is estimated that about one-fourth of the farms had storage structures primarily designed to store ear corn. Most of these structures were corncribs with slatted or wire mesh sides to promote maximum ventilation. A majority of farmers stored their ear corn on floors of barns and sheds, in unoccupied tenant houses, or other improvised structures. Some farmers had enclosed bins constructed of wood on their barn floors. Ear corn was stored in bulk on practically all farms. Storing of shelled corn on farms was rare.

Most farms did not have graintight bins or other facilities primarily used for the storage of small grains. It is probable that at least half of all farmers storing small grains on their farms store them in bags. In recent years, with the increased importance of small grains, especially oats, bulk storage has become more prevalent. A few farmers producing relatively large volumes of small grains acquired metal bins and carried out the practices necessary for the prevention of insect and moisture damage. The good bins and improved practices also were necessary to qualify the grain for CCC farm price-support loans.

Estimating the Volume of Grain Moving From Farms

Reasonable approximations of the quantities of feed grains remaining on farms and moving off farms were obtained by balancing the production of feed grains in 1952, by counties, against the numbers of livestock to be fed according to estimated average feeding practices. The quantities of wheat estimated to have remained on farms and used for

livestock and poultry feed were included in the feed grain supplies. The bushels of oats, wheat, barley, and milo were converted for purposes of this study, pound for pound, to corn equivalent on the basis of 56 pounds of shelled corn per bushel.

GRAINS PRODUCED ON FARMS FOR LIVESTOCK FEED

On the basis of the 1952 production of the respective grains, the following quantities of feed grains, in terms of corn equivalent, were calculated to have been available to feed the livestock and poultry on farms:

	Thousand bushels
Corn	18,945
Oats	10,915
Wheat	1,194
Barley	413
Milo	200
Total, corn equivalent	31,667

FEED REQUIRED BY LIVESTOCK ON FARMS

According to estimated average feeding practices, the numbers of livestock on hand in 1952 required the following quantities of grain feeds, expressed in bushels of corn equivalent:

	Thousand bushels
Hogs	12,114
Dairy cattle	7,862
Chickens	6,393
Turkeys	2,131
Other cattle	1,025
Horses and mules	4,258
Total, corn equivalent	33,783

TOTAL FEED SUPPLIES AND VOLUME OF GRAIN MARKETED

It is recognized that efficient livestock feeding practices on farms do not allow for the feeding of farm-grown grains only. Many farmers bought commercial feeds to supplement or replace their farm-grown grains. For purposes of this study, 1 pound of purchased feeds was estimated to be equivalent to 1 pound of corn. On this basis, available data indicate that the volume of commercial feed bought was equivalent to 10,238,000 bushels of corn. Therefore, it is estimated that the total grain and concentrate feed supply available for livestock feeding was 41,905,000 bushels of corn equivalent. The livestock feed requirements were 33,783,000 bushels, leaving an excess of 8,122,000 bushels of feed grains, expressed as corn equivalent, available to move off farms into commercial channels. These data for each county within the State are included in tables in the statistical appendix, and are illustrated in figure 2.

This method of approximating the volumes of grains moving from farms was used to lend validity to the estimates, which were derived from local county sources of the commercial movement of feed grains from farms. In practically all counties the movement from farms, as calculated by this method, coincided to a substantial degree with the local estimates of such movements.

The South Carolina Department of Agriculture administers the State Feedstuffs Law, which requires that feed manufacturers register with the Department all commercial feedstuffs offered for sale in the State. The volumes registered for sale during the fiscal year starting July 1, 1952, were in reasonable accord with the volumes of commercial feeds estimated as having been purchased by farmers. The combined data from these

respective sources bring out the following facts of some significance in the grain situation:

About 70 percent of the commercial feeds registered for sale in the State in the fiscal year starting July 1, 1952, were registered by feed companies located outside the State, indicating that feed mills within the State manufactured or processed only 30 percent of the commercial feed bought by farmers within the State in that fiscal year.

The commercial feeds registered for sale within the State were indicated as being mixed for the following classes of livestock:

	Percent
Poultry feeds	59
Dairy feeds	14
Hog feeds	9
Horse and mule feeds	2
Miscellaneous unmixed feed ingredients	16

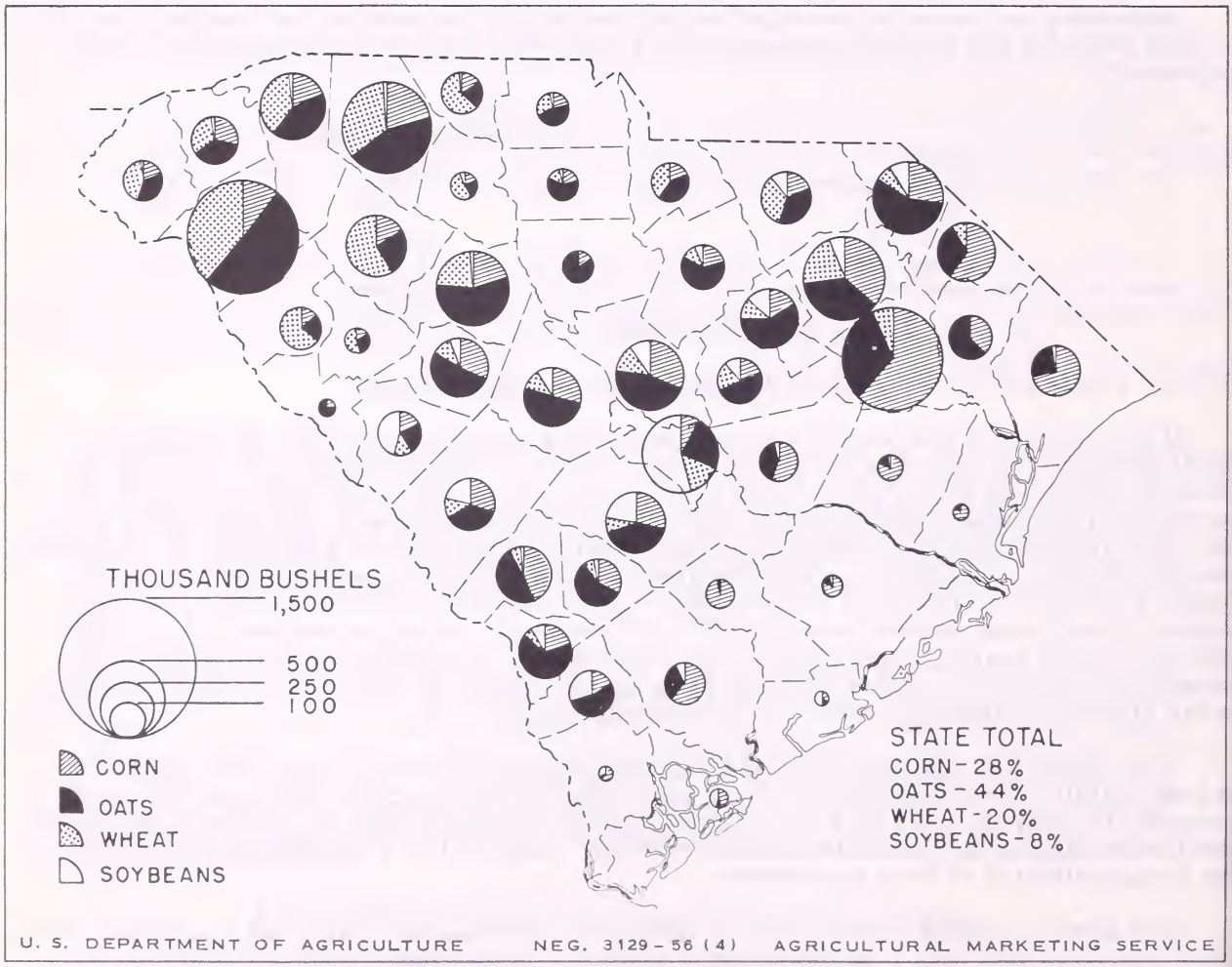

Figure 2. --Grains from 1952 crops moving from farms.

The above observations are made to bring out the fact that a substantial demand exists in the State for commercial mixed feeds, only 30 percent of which was being met by grain feed processors located within the State.

Storage Space Needed on Farms

It is estimated that 15,365,000 bushels of corn from the 1952 crop were used on farms and that 3,580,000 bushels were moved from farms. Also about half of the corn which moved from farms remained on farms where produced at least 1 month. These 1,790,000 bushels of corn together with the quantity that was used on the farms made a total of 17,155,000 bushels of corn that needed good farm storage and care.

It is estimated that 11,975,000 bushels of the 1952 crop of oats were fed to livestock on farms. About 40 percent, or 2,194,000 bushels, of the oats which were sold remained on farms for 1 month or longer. Therefore, a total of 14,169,000 bushels of oats needed good farm storage for at least 1 month.

A total of 1,118,000 bushels of the 1952 wheat crop was fed on farms, and it is estimated that 30 percent, or 769,000 bushels, of the wheat which was sold remained on farms for 1 month or longer.

Practically all soybeans moved into off-farm channels promptly after harvest, and farm storage of soybeans was not considered of great importance.

On the basis of the 1952 crops, therefore, about 17 million bushels of corn, 14 million bushels of oats, and about 2 million bushels of wheat, or a total of 33 million bushels of the three grains, were stored on farms 1 month or longer and required good farm storage facilities and handling practices to prevent insect and moisture damage.

The total storage space needed on farms to care for the above quantities of grains would be governed by (1) the rapidity of feeding the respective feed grains to livestock on farms; (2) the extent to which corn, oats, and wheat are produced on the same farm and (3) the extent to which the same storage space can be used for storing both corn and small grains.

None of the information available indicates that farmers will, or should, store their corn on farms in any form other than in the ear. A bushel of ear corn occupies about twice as much space as a bushel of shelled corn. Therefore, the 17 million bushels of corn (shelled basis) would require 34 million bushels of space for storage on farms. If ear corn were to be stored in a type of facility not suitable for the storage and care of oats and wheat, an additional 16 million bushels of storage space would be needed to store the oats and wheat, or a total of 50 million bushels of space would be needed. However, as shown later, a structure which can be adapted to store ear corn, oats, and wheat in the same space at different times seems quite feasible, according to State sources. The 34 million bushels of space for corn would be needed at harvest in October, and the 16 million bushels of space would be needed for oats and wheat at harvest in June after much of the previous year's corn crop was fed to farm livestock. Therefore, in June the oats and wheat could be placed in the vacated corn storage space and no additional space would be needed.

However, many farms producing corn do not produce oats or wheat; many producing oats and wheat produce little corn, and many farms producing large quantities of oats and corn have substantial quantities of oats on hand at the time of corn harvest. The use of 1 space for 2 or more grains would be limited to the individual farms upon which such grains would be produced. In view of these factors, it is estimated that, in addition to the 34 million bushels of space needed to store ear corn on farms, about half of the oats and wheat remaining on farms 1 month or longer, or 8 million bushels, would need storage space other than vacated corn space. This would give a total of 42 million bushels of space needed to store the corn, oats, and wheat crops on farms. Information obtained from individual farms in each county in the State in 1953 indicates that there were 6

million bushels of reasonably good storage space on farms in which grains could be cared for by using proper practices, leaving 36 million bushels of grain storage space needed.

The above calculations are based upon the 1952 grain crops. The 1952 corn crop had a relatively low yield per acre, as compared with the 1950 yield per acre. If the 1950 yield per acre had been produced on the 1952 acreage, the total production would have been 8.2 million bushels more than was produced in 1952. It is estimated that about half, or 4.1 million bushels, of this corn would have been fed on farms. In addition, about 1 million bushels of the 4.1 million bushels which would have been sold would have remained on farms for 1 month or longer. This additional amount of corn (shelled basis) would require space for 10.2 million bushels when stored as ear corn. Therefore, in a good crop year for corn, about 52 million bushels of space would be needed to store the corn and small grains remaining on farms 1 month or longer.

Movement of Grains From Farms

A total of 12,862,000 bushels of grains moved from farms from the 1952 crops, consisting of 3,580,000 bushels of corn, 5,485,000 bushels of oats, 2,562,000 bushels of wheat, 1,012,000 bushels of soybeans, and 223,000 bushels of the 3 grains--barley, rye, and grain sorghums.

CORN

It is estimated that 19 percent, or 3,580,000 bushels, of the 1952 corn production moved from farms. Counties producing the greatest quantities of corn tended to have the largest percentage of their production moving from farms. In 1952 the movement of corn from farms in Darlington, Dillon, Florence, Horry, Marlboro, Dorchester, Colleton, and Barnwell counties made up nearly half of the total volume of movement from farms in the State.

Mills and elevators in the Piedmont area bought the greatest volume of corn. In general, surplus corn tended to move from counties in the Upper Coastal Plains area to Piedmont counties. In 1952 a few farmers, largely in the Coastal Plains counties, who produced as much as 1,000 bushels of surplus corn for cash sale hauled it as far as 145 miles to market. Grain processing mills and elevators in Mecklenburg, Stanly, Union, Scotland, and Robeson counties in North Carolina bought corn delivered by farmers and local assemblers from South Carolina. The recent improvements in the Coastal Plains area of North Carolina, using low-cost handling practices, tended to attract corn from South Carolina.

About half of the corn that was sold from farms from the 1952 crop moved from farms at harvesttime or within 1 month thereafter. The time of movement from individual farms depended mainly upon the intent of the farmer producing it. If the corn was raised as a cash crop, it was usually sold at harvest or soon after. If it was raised primarily as feed for livestock, that which was sold moved from the farm when the farmer was reasonably sure that he would not need it for livestock feeding. Many dealers stated that little corn moved from farms in the late spring and summer months. Many processors of corn for human consumption said that practically no good quality corn was available from farms in their communities during the summer months and that they were obliged to import corn from outside the State to carry on their businesses.

OATS

It was estimated that 31 percent, or 5,485,000 bushels, of the 1952 crop of oats moved from farms where produced. As with corn, the counties producing the largest quantities tended to have the highest percentage of the crop moving from farms. The greatest volumes of surplus oats moved from farms in Anderson and Spartanburg counties in the Piedmont and counties in the Upper Coastal Plains area.

A large volume of oats moved from the farms where produced to other farms in other counties and areas, with only a part of such volume being handled by commercial buyers. Farmers producing relatively large quantities of oats as a cash crop hauled large truckloads as far as 200 or more miles to mills and elevators, many of which were outside the State. Large quantities of oats were marketed by farmers at processing mills and elevators in North Carolina.

It is estimated that as much as two-thirds of the oats moving from farms moved off farms within 1 month after harvest. Farmers producing oats as a cash crop sold it soon after harvest. Dealers stated that much oats came into the State from outside sources in the fall for sale to farmers as seed oats and for turkey feeding.

WHEAT

It is estimated that about 70 percent, or 2,562,000 bushels, of the 1952 wheat crop moved from farms where grown. The largest movement of wheat from farms was in the Upper Piedmont area, which produced the largest quantity. With the exception of Calhoun and Darlington counties, the movement of wheat from farms in counties below the Piedmont was relatively small in comparison to movement of corn and oats. Off-farm accumulations of wheat in counties in the Coastal Plains area usually came from small quantities marketed from many farms, most of which grew wheat primarily for home use. Information indicates that considerable quantities of wheat from farms in Upper Coastal Plains counties moved to North Carolina mills. Wheat produced for sale as a cash crop moved promptly into commercial channels; usually it was not stored on farms for later marketing, except under the CCC farm-loan program.

SOYBEANS

It is estimated that around 90 percent, or 1,012,000 bushels, of the soybeans produced moved from farms where grown. Soybeans harvested for beans are rarely used in feeding livestock on farms. Some farmers save their own seed and may sell soybean seed to other farmers.

OFF-FARM FACILITIES AND HANDLING PRACTICES

A total of 86 grain buyers were interviewed in all parts of the State (fig. 3). This included all buyers of large volumes and most buyers of moderate volumes. However, operators of many small local grist mills buying small volumes or doing milling mainly on an exchange basis were not included. In some counties buyers who bought small lots from farmers at harvesttime and who operated on a part-time basis, without any grain marketing facilities except perhaps a truck, could not be reached.

The grain handling equipment and facilities of each buyer were evaluated for their suitability in marketing grain efficiently. Information about the quantities and kinds of grains bought, from whom they were bought, and whether such grains were processed or resold was obtained from each buyer.

Of the 86 grain buyers visited, 23 had facilities that were considered good to excellent. All except 1 of the 23 had vertical, self-emptying bulk storage bins built of metal or concrete; 1 elevator used horizontal storage in 2 large quonset-type structures with 10 bins in each structure. Storage capacity of the 23 elevators ranged from 8,000 to 440,000 bushels, and the total storage capacity was about 2.3 million bushels. The design of the structures and the grain handling equipment installed included most of the features usually found in modern elevators, including good-capacity truck scales, husker-shellers, grain drags, legs, cleaners, automatic scales, bulk bins, and dust collectors. Seven of the elevators with the largest capacity had railroad sidings and six had grain dryers of good capacity. Three of the twenty-three had storage capacity of over 200,000 bushels and had the typical vertical, round concrete bins. These 3 elevators were operated by firms having the storage, handling, and shipping of grain as

their principal sources of income. Most of the other elevators were operated in connection with other enterprises such as flour and feed processing, selling of farm supplies, custom feed grinding and mixing for farmers, and cotton ginning. These enterprises required storage structures, usually of one story, for bagged feeds, farm supplies, and processed products. In many instances the structures needed in the grain processing businesses were larger and occupied much more space than the grain elevator installation. The only grain stored in several of these elevators was that needed in the processing businesses.

Fifty-three of the eighty-six grain buyers had facilities that were regarded as relatively poor. Most of the structures were of wood, had been in existence many years, and apparently had been constructed originally as part of a relatively small grain-milling or processing business. Only bagged grain could be handled by the equipment for receiving small grain. The bags of grain were carried from trucks, weighed 1 or 2 bags at a time on a small scale, and emptied into an opening in the floor, all by hand labor. Ear corn was shoveled from a truck into a small hopper, from which it was carried by drag to a husker-sheller of relatively low capacity. Much of the storage used was on flat warehouse floors, with the small grains and shelled corn being piled in bags. Several elevators had small truck scales for weighing in ear corn and a short leg to elevate small grain and shelled corn into small bulk storage bins. Several were in the commercial grain

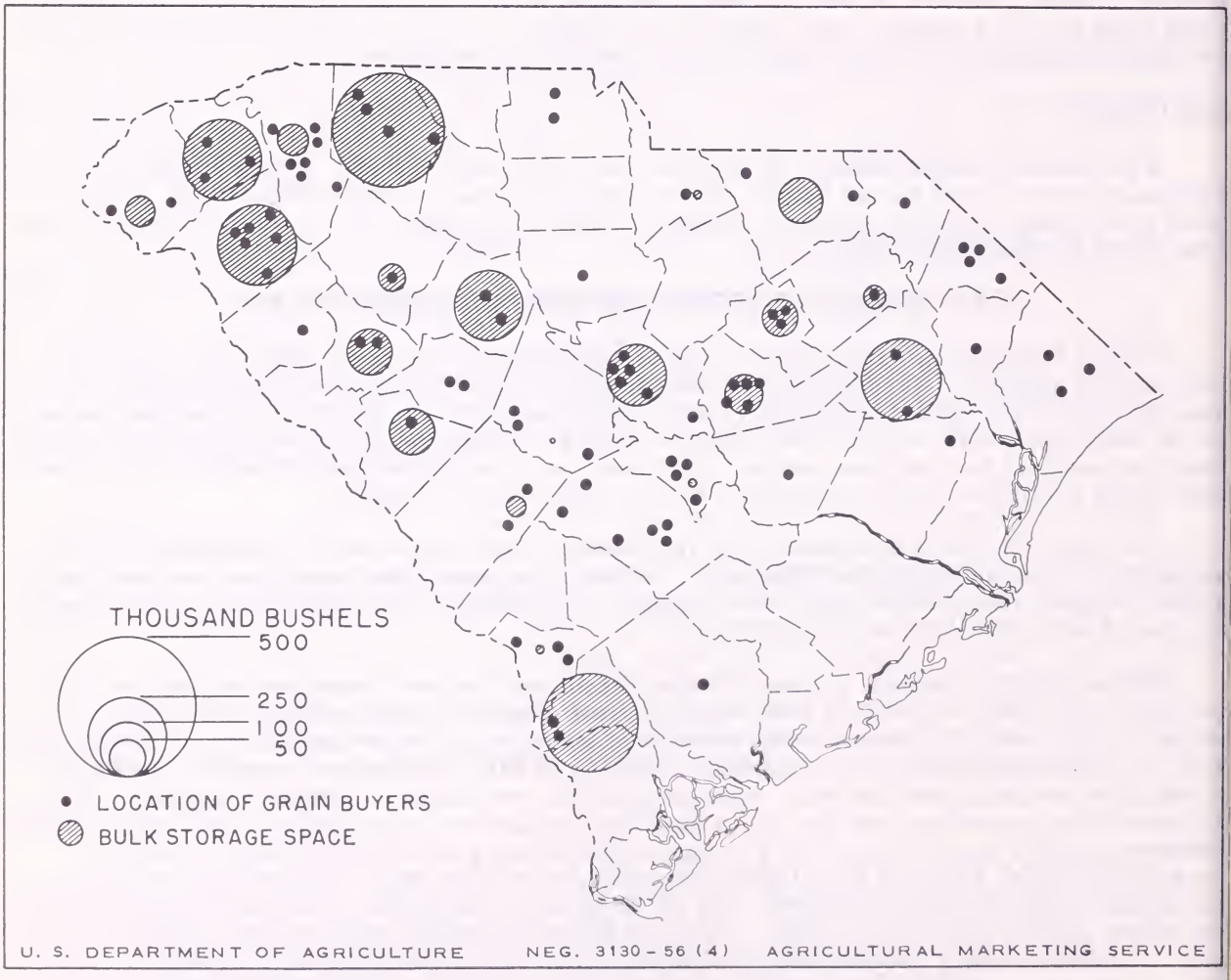

Figure 3.--Approximate location of facilities and total amounts of good bulk grain storage space by counties, 1953.

business, having mainly abandoned a small processing business. However, that business was that of receiving, handling, and storing all grain in bags, using hand labor, and having practically no mechanical facilities. Grains were dumped from bags at times into large trucks for bulk outshipments. A total of 14 out of the 53 had a few self-emptying bins, but only 5 of these had more than 5,000 bushels of storage space. With the exception of corn husker-shellers, these units had very little equipment and few structures that could be used in efficiently designed and equipped grain handling and storage units, either small or large. Many of these units were the only markets for grains in their local areas. Several received and processed grain on an exchange basis, taking grain toll in exchange for grinding corn grits and meal, or directly exchanging grain received from farmers for processed grain products. In most of these units the grain receiving and handling operations were carried on in connection with other enterprises, such as cotton ginning, buying and selling farm produce, feed and seed dealing, selling farm supplies, and cotton or tobacco warehousing.

Ten grain buyers operated as merchant truckers. Having no permanent facilities for receiving, handling, and storing grain, these buyers usually hauled the ear corn and bagged grain they had bought at farms directly to receiving elevators or mills in the area. Most of their operations were in June and July after the small-grain harvest and in the fall after the corn harvest. At other times the trucks were used in other types of hauling or could be hired by farmers to haul grain from farm to market. At times these merchant truckers used warehouse floors to stack bagged grains, and in years of heavy production they piled ear corn on warehouse floors. Five of these buyers operated the grain buying business in connection with ginning and warehousing cotton, selling farm supplies, feeds, and seeds, and similar businesses. Merchant-trucker operations were usually found in areas not producing enough commercial grain to support a good grain handling and shipping unit and in areas where surplus grains were accumulated in small quantities from many farms.

Volume of Grains Handled

Out of a total of 8,437,700 bushels of all grains reported as purchased from the 1952 crop by the grain buyers, 72 percent was purchased direct from farmers, 6 percent from other dealers within the State, and 22 percent from sources outside the State (fig. 4). About 57 percent of all grains purchased was processed within the State; 17 percent was sold outside the State; 16 percent was sold to other dealers within the State; and about 10 percent was sold to farmers within the State.

CORN

Grain buyers reported that they bought 1,614,300 bushels of corn from farmers and 1,739,000 bushels from other dealers, mostly outside the State. They bought 14 percent white corn and 86 percent yellow corn from farmers. Importations of corn were 8 percent white and 92 percent yellow. Dealers bought corn originating in North Carolina, Tennessee, and the Corn Belt States. Some corn from Illinois moved up the Tennessee River to river ports in northern Alabama and was trucked from there to South Carolina mills. Most of the corn from North Carolina came by truck. Small local mills bought new corn from North Carolina in August and September.

Dealers reported only a relatively small quantity of corn purchased from other local dealers. Out of a total of 3,353,000 bushels of corn purchased from all sources by buyers, 2,440,000 bushels, or 73 percent, was processed by purchasing mills and the rest was sold as whole grain, about two-thirds of which was sold to local feed and seed stores and small grist mills. Only small quantities of corn were sold by dealers direct to farmers. Very little corn was sold to other grain dealers outside the State.

South Carolina mills processed 826,500 more bushels of corn than they bought from South Carolina farmers. The relatively low yields of corn in 1952, which led farmers to offer smaller quantities of corn for sale than they would have offered with higher yields,

probably explain in part the lack of corn for purchasing by mills. However, many mill operators stated that they purchased substantial quantities of corn from sources outside the area every year. Such purchases were usually made in the latter half of the corn marketing season when the offerings of corn from local farms were of low quality.

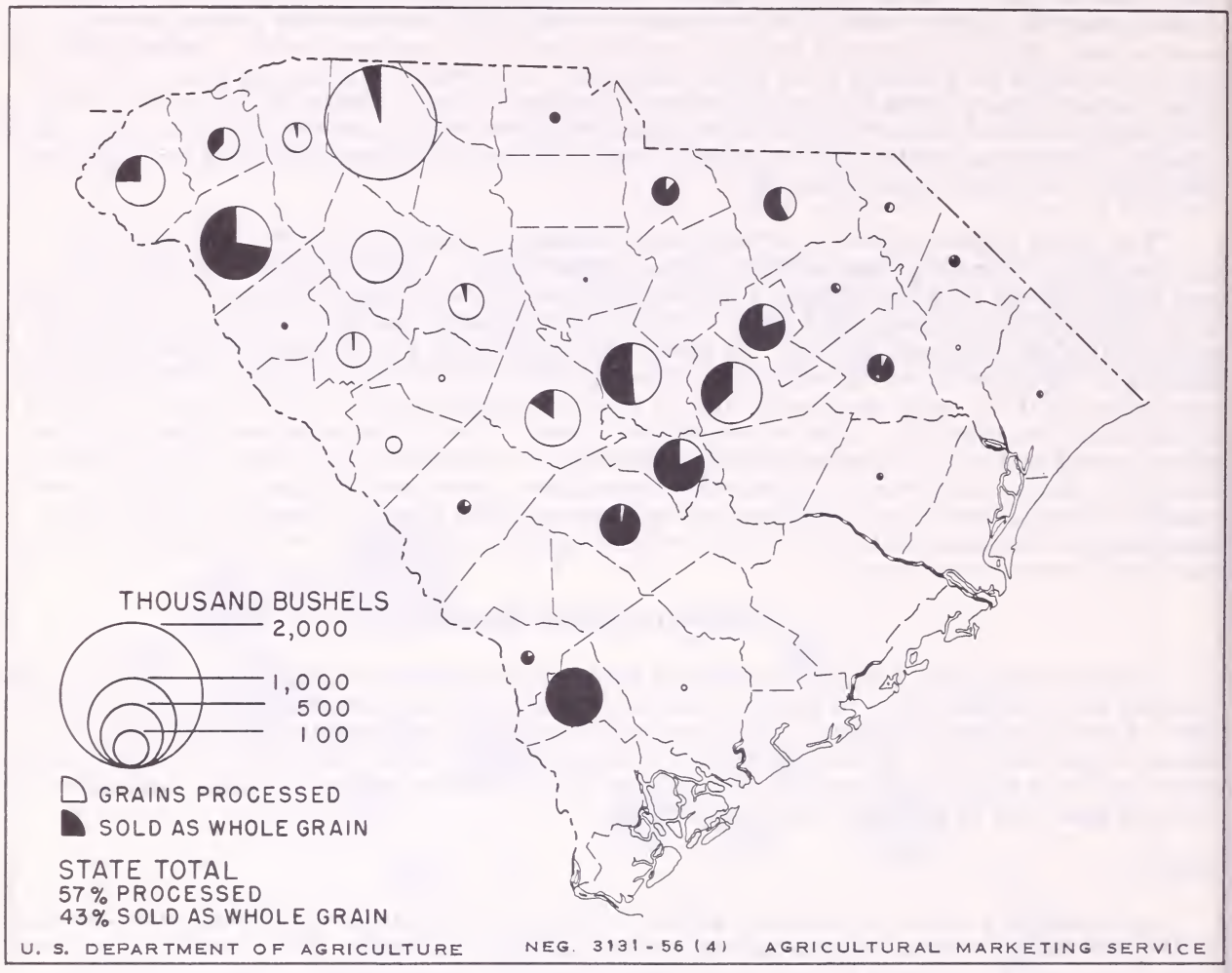

Figure 4. --Grains purchased by grain buyers and proportion processed and resold as whole grain, by counties.

OATS

Grain buyers reported that they bought 2,263,100 bushels of oats, 79 percent of which was purchased directly from farmers and 21 percent from other dealers. Only about 6 percent of the total volume of oats bought by dealers was grown outside the State. The quantity purchased by dealers did not include the 437,000 bushels reported moving from farms under CCC loan procedures.

About half of the oats purchased by dealers was processed, about one-third was sold to farmers, and the rest was sold to other dealers. No large volume of oats was in storage in off-farm facilities. Many farmers producing substantial quantities of good quality oats stored them in good structures on their farms and sold them during fall and winter months to other farmers for seed purposes.

WHEAT

Grain buyers reported that they purchased 1,847,400 bushels of the 1952 wheat crop, with 94 percent being purchased direct from farmers, and only 80,000 bushels being imported from outside the State. Mills and elevators located in counties in the northwestern part of the State, as well as those in Richland and Lee counties, purchased the greatest quantities of wheat from farmers. Substantial volumes of wheat were acquired by mill operators in Anderson and Oconee counties on an exchange basis. The long-standing habit of farmers' depositing relatively small quantities of wheat with local millers on credit, with the value being taken in trade during the year, was still common practice in certain communities.

About 63 percent of all wheat purchased was processed. The extent to which the wheat reported as processed went into products for human consumption was not determined, but dealers estimated that as much as one-half of the wheat processed in the State went into livestock feeds. Some mill operators stated that their purchases of wheat from farmers for processing for human consumption tended to be limited to the first 2 months after harvest. After that time, most wheat which had been stored on farms became so seriously damaged by either insects or high moisture, or both, that it was not suitable for processing for human consumption. About 15 percent of the wheat reported purchased by mills and elevators was sold to dealers outside the State, and about 22 percent was resold to other dealers in the State. Dealers sold very little wheat to farmers.

SOYBEANS

Dealers reported buying a total of 869,500 bushels of soybeans from the 1952 crop. The greatest volumes were purchased by dealers in the Upper Coastal Plains area. Only one dealer in the Piedmont area reported purchasing soybeans. The largest purchases from farmers were made by buyers in Hampton, Allendale, Calhoun, Orangeburg, and Richland counties. Many soybeans were purchased by buyers in Augusta, Ga. The mills and elevators reporting the purchase of soybeans did not buy any soybeans from other dealers. Nearly all soybeans sold by dealers were sold to firms with processing plants outside the State. Some few beans were sold to farmers for seed.

BARLEY AND GRAIN SORGHUMS

These grains were of minor importance in commercial channels. A total of 60,800 bushels of barley and 13,600 bushels of grain sorghums were purchased from farmers from the 1952 crops. One dealer purchased 25,000 bushels of barley from a local dealer, and 5,000 bushels of grain sorghums were imported from outside the State. Nearly all barley and grain sorghums were used in local feed processing with a small quantity sold to farmers for seed purposes.

Volume of Grains Bought, by Type of Facilities

The number and type of facilities and the volume of grain bought by type of facilities are shown in table 1.

The operators of good to excellent facilities bought 5,744,000 bushels of grain or 68.1 percent of the total; operators of poor facilities bought 23.8 percent and merchant truckers bought 8.1 percent. The 23 buyers with good to excellent facilities included elevators and mills that bought the largest quantities of grain, purchasing an average of about 250,000 bushels per unit. The operators of poor facilities purchased an average of 38,000 bushels of grain per unit, most of these units being local grain processing mills.

Although more than two-thirds of all grains bought were bought by operators having reasonably good facilities, the distribution of these facilities over the State was not uniform geographically, and in some grain-producing sections no facilities were available.

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Much of the grain delivered to these good facilities came in relatively large loads and was hauled long distances from the farms where produced.

Table 1.--Number of facilities, storage space, and volume and percentage of grains bought, by quality of facilities and equipment

Facilities and equipment	Number of facilities	Volume of storage space	Grains bought	
			Quantity	Percentage
		1,000 bu.	*1,000 bu.*	*Percent*
Good to excellent	23	[1] 2,344	5,744	68.1
Poor	53	[2] 205	2,007	23.8
No permanently located facilities (merchant truckers)	10	-----	684	8.1
Total	86	2,549	8,435	100.0

[1] Also had 313,000 bushels of horizontal space available for grains in bags.
[2] Space for 179,000 bushels of grain in bags and 26,000 bushels for bulk grain.

Volume of Grains Bought, by Type of Operation

Buyers of grain were classified according to the types of grain business carried on: (1) Dealers only, (2) processors, and (3) both dealers and processors. The number of grain buyers and the quantities of grains bought by types of operators are shown in table 2.

Table 2.--Number of buyers and quantity and percentage of grain bought, by type of buyer

Types of buyers	Number of buyers	Grains bought	
		Quantity	Percentage
		1,000 bushels	*Percent*
Dealers only	34	2,693	31.9
Processors only	39	4,244	50.4
Dealers and processors	13	1,498	17.7
Total	86	8,435	100.0

The 34 grain dealers each bought an average of 79,000 bushels of grain, or 31.9 percent of the grain that was bought by all buyers. The 39 buyers operating grain processing mills bought an average of 108,000 bushels of grain and processed all they bought. Buyers who were both grain dealers and processors bought an average of 115,000 bushels each, part of which was resold as whole grain and part of which was processed. The dependence of farmers upon grain processors for markets to sell their grains is obvious. Buyers who bought grain for processing bought more than half of all the grains.

MAJOR DEFECTS IN THE GRAIN MARKETING SYSTEM

The most serious defects in the grain marketing system in the State in 1953 were (1) the lack of good storage facilities and practices on farms to care for farm-stored grains; (2) the use of excessive amounts of labor and the use of bags in harvesting and storing small grains on farms, (3) the lack of off-farm facilities and handling practices necessary to receive, handle, and store grains at low cost, as well as to preserve quality and

render good service to farmers, (4) the lack of accurate methods at off-farm facilities for determining quality and grade of grains for use in establishing equitable prices, and (5) the lack of accurate methods at off-farm facilities for determining quantity of ear corn delivered by farmers so that farmers can be paid for the exact quantity of corn marketed in individual lots.

On-Farm Defects

On most farms both small grains and ear corn were stored in any convenient location out of the weather. Abandoned tenant houses, barn floors, cotton sheds, backporches, and other places were used. On farms visited few structures specifically designed for grain storage were found.

Places of storage, especially for ear corn, usually could not be adequately cleaned or fumigated, and the insects lived over from year to year. Much corn became infested with insects in the fields before harvest and was dumped into infested facilities. Damage by rodents, poultry, and livestock was common. Small grains were harvested too wet for safe storage and, as a result, they became molded, went off-color, and developed an odor in farm storage.

Combines with bag attachments were used in many areas. This method of harvesting and handling the grain was more expensive than bulk handling because bagging the grain required much more labor than bulk handling, and the cost of bags was high.

Off-Farm Defects

In the 23 elevators having reasonably good equipment the most common defect, and the most important from the standpoint of hindering the fast movement of grain, was in the type of receiving equipment and in its arrangement. Some of the larger facilities had no mechanical truck lifts for emptying bulk grain from trucks, and grain receiving was slowed up by the use of hand labor. In some facilities the arrangement of the dump pits made it necessary for trucks to back over, or up to, the pit to unload instead of driving over a grated pit, stopping to unload, and then moving on. Some dump pits were too small to accommodate large loads of bulk grain. Inadequate protective enclosure over the dump pits often stopped the receiving of grain on rainy days, and water could run into some of the pits during heavy rains.

Facilities that received ear corn as well as small grains often had the dump pit for receiving ear corn too close to the pit for small grain or the pits were located in the same driveway, which prevented the receiving of both kinds of grain at the same time. At some elevators corn shelling was carried on with inadequate blowers or dust collecting equipment. This lack of equipment created undesirable working conditions as well as health and fire hazards.

Some facilities were handicapped by not having grain conveyors and legs of sufficient capacity. This defect often limited the operations to the receipt of only one kind, or quality, of grain at a time. One large storage elevator had only one high-capacity leg, which limited operations. The leg could not be turning or loading out grain at the same time that it was receiving grain.

Certain of the 23 good elevators lacked efficient equipment for weighing grain in and out. The receiving operation was occasionally slowed down because a low-capacity automatic scale was installed with other high-capacity equipment. This prohibited the other equipment from operating at full capacity. Often the platform scale was too close to the grain dump to allow for efficient weighing of loaded and unloaded trucks. Many of the large grain storage bins in several of these elevators were not of the self-emptying type. The bins required hand labor to remove the grain that would not flow out by gravity. The bins were used mainly for operating storage, with any one lot of grain remaining in them a short time. Several of these elevators were operated with grain processing businesses.

Structures and facilities needed in an expanding processing business had used all of the available space around the elevator. Certain elevators and the accompanying grain processing structures were located in the business area of town where no room was available for expansion, and elevator and mill traffic contributed greatly to traffic congestion.

The major defects in the 53 grain receiving units having poor facilities were as follows:

Few facilities were available for receiving bulk grain efficiently. Ear corn was shoveled from trucks into small hoppers, from which it was conveyed to a husker-sheller. The capacity of the husker-sheller was too low to shell the corn rapidly. Dump pits or hoppers were so constructed that the drag from the pit to the husker-sheller would not fill by gravity but required hand labor. In certain units the shelled corn was bagged and stacked on a warehouse floor, no good bins being available. Small grains were received in bags, carried from trucks, weighed 1 or 2 bags at a time, and then dumped into a hole in the floor, under which was located a small hopper. Some units received, handled, and stored small grains in bags.

Some units had acquired one piece of good equipment of reasonably good capacity, but had installed it in the line with other low-capacity equipment. A good leg may have been installed but a good conveyor or drag to feed it was lacking, thereby nullifying any economies associated with fast handling. Most units did not have enough self-emptying storage bins to allow for having more than 1 or 2 types or grades of grain on hand at one time.

Storage space would not allow for efficient grain turning and fumigation of insects. This was particularly significant in units operated with the processing businesses, where working stocks of grains were stored for longer periods than at units operated by grain dealers. Grain stored in bags on warehouse floors and platforms could not be protected either from the weather or from insect damage.

Lack of dust and trash collectors allowed dust and debris from corn shelling, grinding, and mixing operations to settle on floors, machinery, bagged grain, and other objects. This created both fire and health hazards, was a neighborhood nuisance when the mill was located adjacent to residences or business houses, and in the mill supplied an excellent breeding area for insects.

In general, the deficiencies in equipment and facilities in the units classed as poor were so many and various that in most instances if an efficient unit for receiving, handling, and storage of grain were installed, little good equipment could be used from the present installations. In many units the space available was too small and its location was undesirable.

Defects in Price-Making Methods

Most of the buyers who bought grain from farmers had no satisfactory method of calculating prices to be paid farmers for delivered grain. In certain local areas where some competitive buying may have existed, the prices for individual grains quoted by individual dealers was usually based on "what the other buyers are paying." It was usually found that the buying prices of the elevator or mill that bought the greatest volume of grains tended to be quoted as the current buying prices of the smaller volume dealers.

It was not an objective of this study to make detailed inquiry into the price-making mechanism used by grain buyers, but observations indicate that dealers tend to pay "what the traffic will bear" and still secure a normal volume of business in a normal production year. This was particularly true regarding prices of feed grain. Quoted wheat prices tended to have some possible relationship to "outside" or national prices, especially those prices quoted by the dealers buying the largest volumes. Apparently, even with these buyers any determined relationship was subject to individual interpretation.

One serious defect in the price-making mechanism was associated with the lack of accurate determination of quality and quantity of the grains. Although many buyers had certain items of good equipment for determining moisture content and other quality factors, the equipment apparently was not used consistently, if at all, in determining the quality of individual lots of grain purchased from farmers. Although prices paid for corn were apparently based upon a standard bushel of 56 pounds of shelled corn, no methods were consistently used whereby the quantity of shelled corn in an individual lot of ear corn could be accurately determined.

Local CCC loan prices were noted as being of some importance in certain local areas in establishing a price level around harvesttime, because they were cited as being an alternative available to local farmers for converting their surplus grains into cash. However, most farmers did not have acceptable facilities for farm-storage loans, and in most areas sufficient off-farm storage space was not available for warehouse loans.

A serious defect in the marketing system was the complete inadequacy of the present marketing operation for oats. In many areas the off-farm movement of oats has increased greatly within recent years. The off-farm facilities necessary to establish prices, handle, and merchandise this large volume of oats efficiently is seriously lacking in many local areas. Many dealers had not developed good market outlets in other States for the increased production of oats, in addition to not having good facilities to handle them, and therefore were rather reluctant buyers, especially in the heavy marketing season. Many farmers who were financially able, kept their oats on their farms in covered areas and subject to insect infestation and damage by rodents, moisture, and other causes. Such farmers thought that the advance in prices after the peak marketing season was more than enough to pay for any damage done by not having good farm-storage facilities and practices.

IMPROVEMENTS NEEDED IN FACILITIES AND PRACTICES

To bring about the greatest efficiency in the grain marketing system in South Carolina, grain producers and handlers must make major improvements both on and off farms. Improvements are needed in farm facilities and practices so that the farmer may spend the least amount of time and expense in harvesting, maintaining quality, and marketing his crop and in off-farm facilities and practices so that when the crop is moved from the farm it can be handled efficiently by the buyer and stored, processed, or otherwise disposed of with the least amount of time and expense. Low-cost facilities and handling methods on farms must be accompanied by low-cost facilities and methods off farms to bring about the most economical overall system of handling, storing, and marketing grains. If a farmer adopts bulk harvesting and handling of his small grains and the buyers' facilities are adapted only to receiving bagged grain, the farmer will find that it would have been better for him to continue to bag his grain. If an elevator installs good bulk receiving facilities and the farmers continue to bring their grain in bags, such receiving facilities may be less useful than the bag facilities which were replaced. If a farmer stores his grain in a good structure, cares for it, and moves it to the elevator in top quality, he loses his incentive for such improvements if the buyer does not buy it on a quality basis.

Harvesting Methods and Facilities on Farms

The first improvement necessary in harvesting is the use of bulk handling attachments on small-grain combines to eliminate the handling of small grains in bags. Operating a combine that requires the bagging of grain takes 2 to 3 times as much labor as bulk handling. Bag combines were observed in operation in which a total of six men were used in the field harvesting job. In contrast, the use of a bulk combine was observed in which the entire operation needed only two men. The rate of harvesting per hour was similar. In certain local sections with high yields per acre, the lack of rapid bagging with a bag combine slowed down the rate of harvesting considerably. On such high-yielding fields, a truck can move with the combine and be loaded from the bulk hopper on the combine without stopping the combine. The use of bag combines has no significant ad-

vantages over bulk combines and serves only to increase the costs of harvesting and grain handling.

Another harvesting practice that contributes to losses in grain is combining small grains when the moisture content is high. The grains may be combined too early in the season or they may be combined during a time of day when their moisture content is too high. Fully matured small grain standing in a field may pick up as much as 6 to 8 percent moisture during the night. Grains harvested with too high a moisture content tend to spoil quickly in storage unless properly cared for. It probably would be much cheaper to postpone combining for 2 or 3 hours than it would be to pay the costs of drying the grain for safe storage. This alternative is available to the farmer having his own combine, but the farmer who has his grain combined on a custom basis may be in a different situation. The operator of a custom-service combine wishes to cover as many acres in a day as possible in order to get a maximum income. The moisture content of the grain usually is not his primary concern, providing it is not too wet to thresh out efficiently. In this situation a farmer can only try to convince the combine operator that his small grain should be combined only in the hours in the day when the moisture content is relatively low. If all combines operated only during these optimum hours, however, it might result in increases in custom-combine rates, because in most instances the hours of combining per day would decrease.

One requirement in bulk harvesting and transportation is a truck having a body which will hold small grains. Farms producing only small quantities of wheat, oats, barley, soybeans, and similar crops, may find that a pickup truck with a standard metal body could provide enough space for bulk grain hauling. Farmers producing substantial quantities of small grain or soybeans may find that a small truck is not economical, especially if the grain is for off-farm sale and is delivered to an elevator or mill some distance away. Most larger capacity trucks do not have graintight bodies, but existing bodies can be altered and made graintight by various improvised and inexpensive methods. Canvas tarpaulins as well as thin plywood and other graintight materials can be used temporarily with stake bodies and livestock trucks to make them graintight.

A structure for the storage of corn on farms should meet three basic requirements: (1) It should allow for air drying of ear corn with the husk on; (2) it should allow for the fumigation of such ear corn to prevent insect damage, and (3) it should be rodent-proof and should exclude all birds, farm poultry and livestock, and other animals from contact with the grain to prevent damages and contamination from this source. Storing of ear corn rather than shelled corn will probably continue on South Carolina farms because most of it will continue to be fed in the ear as corn and cob meal. In years of wet harvest weather, ear corn may come from the field with too much moisture in the grain and with a wet husk. If this corn is stored where it has adequate ventilation, it usually will dry out without the grain's being materially damaged. Although conclusive proof is lacking, information indicates that a major part of the damage by insects in stored ear corn can be prevented by proper fumigation, if the ear corn is enclosed in a reasonably airtight structure.

For the storage of small grains, the structure should (1) allow for effective fumigation to prevent insect damage, (2) be rodent-, bird-, and animal-proof, and (3) provide for effective drying by natural or forced ventilation and perhaps turning.

Obviously, if one suitable structure could be designed in which a farmer could store both his ear corn and his small grains and effectively care for both, that one type of structure would probably be the most practical and economical for the average farmer. Harvesting dates are several months apart, and the space needed for ear corn in the fall could be used also for small grains the following June when the stocks of corn would be low.

It is thought that if farmers are careful and harvest their small grains at a relatively low moisture content so as not to require hand turning, one rather simple structure can satisfy the basic requirements for good storage and care of grain. This structure is an

adaptation of the somewhat common corn-crib with slatted or wire mesh sides which is usually designed for the air-drying of ear corn. The crib should be made reasonably air-tight on the bottom and ends, either in the original construction or with the use of thin plywood or hard fiberboard. One or more doors hinged at the top that could be lowered and fastened over the slatted or wire sides with masking paper over the joints on the outside would provide a reasonably tight enclosure for effective fumigation. After fumigation, the hinged doors could be propped open to allow ventilation, and the doors would protect the sides of the crib from rain. If small grains are to be placed in the crib in bulk, the crib can be temporarily or permanently lined with screening wire as fine as necessary to enclose the small grain but also to allow for ventilation. Small grains in bags can also be fumigated when stored in this type of structure. This structure would also have an advantage in that it could be constructed with common lumber in any size to suit the needs of an individual farmer. If small grains and ear corn were to be stored at the same time, partitions between studs could be readily installed to separate the grains. Standard features to exclude rodents would be required, as well as appropriate doors for filling, emptying, and applying fumigants. It is estimated that this type of structure would cost somewhat less than 30 cents for each bushel of space, providing most of the labor is available on the farm.

Provision of good storage space, such as bins, cribs, or other appropriate structures, does not in itself guarantee that the grain will be protected and the quality maintained. Appropriate structures supply only a good physical environment which allows the possible grain damage to be controlled in an effective manner. Effective control measures and practices must accompany good storage structures.

Off-Farm Storage

SPACE NEEDED

Data indicate that storage space for 2,370,000 bushels was available in off-farm facilities that were considered to be adequate for proper care and efficient handling of grains. In addition, 492,000 bushels of bagged grains were stored in facilities, in which the grain could not be cared for or handled efficiently. Nearly all of this space was used for operating storage. Apparently with a volume of grain moving from farms similar to the volume from the 1952 grain crops, operating storage space for about 2,860,000 bushels was used. Therefore, good storage space for 492,000 bushels of bulk grain was needed to replace that space used in the poor facilities.

The question arises as to the possible need for off-farm commercial storage space in which farmer-owned grain could be stored under the CCC grain loan program. Apparently, the possible hazards associated with the grain-storage business, as well as the possible incomes from that business, have tended to prevent the substantial investments necessary in constructing facilities needed to carry on this type of business. In the long run, farmers wishing to participate in the CCC loan program will find that the good facilities needed for caring for grains on farms, whether such grains are eventually sold or fed to livestock, probably will be suitable to qualify for on-farm storage loans. The cash costs of using off-farm storage space would pay for the construction of adequate on-farm facilities in less than 3 years at 1953 construction costs and off-farm storage rates. Even if off-farm commercial storage facilities were available, it is probable that most farmers would find it more economical in the long run to participate in CCC loan programs through on-farm storage loans in good farm facilities.

IMPROVEMENTS NEEDED, BY COUNTIES

New facilities are suggested for particular counties with the belief that one or more of the dealers already in business there have a better opportunity to continue in business by installing efficient facilities and practices in their present locations than new dealers would have with new facilities in new locations. It is not suggested that all buyers should invest in good facilities. In actual practice, the buyer who first develops efficient facilities and practices and renders the lowest cost services to farmers will attract the grain

volume from farmers and tend to eliminate competition from those who make no improvements. All other factors being equal, the grain buyers having high-cost facilities and operating methods are eventually driven out of business by buyers who have low-cost facilities and methods. The grain buyer who first uses low-cost facilities and methods in his local area is in the most favorable competitive position, providing he transfers the benefits of at least a part of such low-cost operation to the farmers in relatively higher grain prices and improved services.

New facilities in specific locations also are suggested on the basis of (1) improvements needed in grain marketing services to farmers, (2) possibilities of the new facilities' having a sufficient volume of grain available to pay for themselves, (3) existence of competitive facilities within a reasonable distance, and (4) possible changing of merchandising practices of buyers with good facilities (primarily processors).

Counties that have no elevators and for which none are suggested.--There were 13 counties in this category:

Dorchester	Barnwell	Fairfield
Charleston	McCormick	Berkeley
Beaufort	Cherokee	Georgetown
Jasper	Union	
Bamberg	Chester	

With the exception of Bamberg and Barnwell counties, the counties in this group received such a small volume of grains from the 1952 crops from farms that it is likely that even a low-cost grain assembly elevator could not acquire enough grain to pay for itself. Farmers in these counties who had surplus grains to sell either hauled them relatively long distances to buyers having facilities in other counties or sold them to other farmers. In certain of these counties grain was bought at farms by truckers, and grains moved from some farms at harvesttime to local assemblers such as feed and seed dealers, portable shelling outfits, and other small-volume handlers.

Enough grain in Bamberg and Barnwell counties moved from farms in 1952 to warrant a good low-cost assembly elevator. However, a new elevator located in either of these two counties probably would face heavy competition. There is a good elevator above the Barnwell County line in Aiken County and one below in Hampton. If an efficient unit were developed in Orangeburg County, as is later suggested, it could serve farmers in Bamberg and Barnwell counties. If the buyer and processor having good facilities in Allendale county were to become a grain merchant and buy all grains offered by farmers, that elevator could also serve some farmers in Barnwell and Bamberg counties. If rainfall were normal during the corn growing season, much more corn would move from farms than is estimated to have moved from the 1952 crop. If the dealers in the counties surrounding Barnwell and Bamberg counties improve their facilities and practices, they can render good service to farmers in these two counties. Under these conditions a new elevator in either of the two counties probably would not be feasible.

County having no facilities and one recommended.--The only county having no buyers and no facilities in which a low-cost assembly elevator would appear to have a reasonable chance of success is Kershaw. Producers of surplus grain in the county in 1953 could sell to grain buyers having good facilities in Lee, Richland, Lancaster, and Sumter counties. For most farmers in the county this is a rather long haul. If a low-cost country assembling unit were located towards the northeastern part of the county it could also draw grain from the western part of Chesterfield County, which has a good grain elevator only on its northeastern border at Cheraw. Kershaw County is in the area of increases in oats production in recent years, and with normal growing weather, considerably more corn would move from farms in the county than moved from the crop of 1952.

Counties needing major improvements in existing facilities.--Counties in this category are as follows:

Orangeburg	Abbeville	Williamsburg	Dillon
Calhoun	Marlboro	Horry	York
Saluda	Clarendon	Marion	Colleton

In all of the above counties grain buyers were doing business in all types of makeshift facilities and structures, in most instances having very few items of equipment that would be of value in establishing an efficient grain handling unit. None of the buyers had enough facilities and equipment to justify the unit being called a grain elevator. The grain receiving and handling job was being done with facilities and methods conducive to high costs of operation. The volumes received ranged from the small needs of a local mill and corn sheller to large volumes from surplus producing sections. Many producers of surplus grains from some of these counties hauled their grains to good elevators in other counties where they could get reasonably efficient services. Buyers of grains in these counties were mainly grain merchants who bought grains from farmers and moved them on to other buyers within or outside the State. Very few of these grain merchants processed any substantial volume. The need in the individual units is for facilities for receiving, handling, and moving grain efficiently.

Counties needing minor improvements in existing facilities.--Counties having one or more reasonably good grain elevators in 1953 were the following:

Hampton	Newberry	Greenville	Darlington
Allendale	Greenwood	Laurens	Lee
Richland	Anderson	Spartanburg	Sumter
Lexington	Oconee	Lancaster	Florence
Edgefield	Pickens	Chesterfield	Aiken

In these 20 counties 23 grain receiving and handling units were located. Six of these units were operated by firms doing grain merchandising only, 11 were operated by firms doing processing only, and 6 were operated by processors who were also grain merchants. Twelve of these twenty-three units had practically all of the equipment and facilities needed in an efficient grain elevator. The investments in improved units of equipment needed to make these elevators of greatest efficiency would be comparatively small. The primary need in 14 of these was for truck hoists and enlarged dump pits to make the receiving of bulk grain in large loads more efficient. Some elevators in this group had good bulk receiving equipment as well as that necessary for bag receiving. This was especially true when the elevator was operated in connection with the processing business. In 9 of these counties, good to excellent elevators were being operated by processors who bought only the grain which they needed in their processing businesses. Usually the quantities of grains moving from farms were in excess of the processors' needs. In such cases many farmers were obliged to haul rather long distances to other elevators, or to sell their grains to truckers when the local elevators were not buying. It is suggested, therefore, that these processors become unlimited buyers in their processing businesses. The good to excellent equipment and facilities needed to do a low-cost marketing job was already in limited use, and its unlimited use would result in substantial benefits to farmers and to the owners of the equipment and facilities.

GRAIN ELEVATORS: FACILITIES AND OPERATION

Functions of Grain Elevators

The grain marketing job to be done is of great importance in determining the type, size, and cost of an elevator in a specific location. The job to be done by an elevator in rendering efficient service to farmers is either one or both of the following:

1. Assembling grain from farms and moving it from that point to other points farther along in the marketing channels.

2. Storing grain for an extended period of time.

If the job to be done at any one point is the assembly and movement of grain, the type and size of elevator unit to do that job only is needed. If the job to be done at that point is assembly, movement, and storage for a period of time, the type and size of elevator unit to do those jobs is needed.

The type of elevator needed for efficient assembly and movement of grain is quite different from the type necessary for storing grain. The two types require greatly different investments. Cost data indicate that an elevator designed to receive, handle, and ship about 250,000 bushels of grain a year could be constructed for a maximum of approximately $25,000. This elevator could have efficient equipment to receive grain from farmers in bulk, clean the grain if necessary, and grade, temporarily store for assembly purposes, and load it into trucks or rail cars for movement to other buyers. This elevator would need a capacity of around 500 bushels per hour in its receiving and handling equipment. It would probably need from 10,000 to 15,000 bushels of storage space, divided into at least 12 bins, the number of bins needed depending upon the types and grades of grain received from farmers in the elevator trade area.

With this type of elevator operation, the ability to handle and move grain is primarily determined by the number of hours the elevator operates. In an 8-hour day, with a capacity to receive 500 bushels per hour, 4,000 bushels could be received. The capacity to receive grain would be regulated by the ability of management to sell it and move it away from the elevator. Receiving 4,000 bushels a day for 3 days would nearly fill all the bins. Unless the bins were emptied at least as fast as grain was received, the elevator would have no holding space and would be obliged to stop the receiving operations temporarily.

With a receiving capacity of 4,000 bushels a day, it would take about 62 days of operation to handle 250,000 bushels. The elevator could work overtime during a peak marketing season of perhaps 30 days and could receive an additional 120,000 bushels if it had the opportunity.

The capacity of an elevator designed to receive, handle, and move grain can be expressed only in the ability of the elevator to move grain. The fact that it may need 15,000 bushels of storage space to expedite the grain movement has no significant relation to the capacity of the elevator. Based on estimates obtained from elevator and mill operators as to wage rates and other costs of elevator operations in South Carolina, an approximate yearly cost of operating this type of elevator could be as follows:

Labor--1-1/2 man-years	$2,700
Repairs and upkeep	350
Power	600
Maintenance	250
Miscellaneous (including taxes)	675
Total	4,575
Amortization cost	2,006
Total	6,581

The amortized cost of the $25,000 investment is calculated on the basis of 5 percent interest for 20 years. It is assumed that a handling margin of 8 cents a bushel could be obtained on the 250,000 bushels of grains received, handled, and moved through the elevator during the year. This would give a gross income of $20,000. On the basis of the above estimated costs of operation, a net revenue of $13,419 would be the income to management. Under a handling margin of only 6 cents the net income would be $8,419.

Operation of an elevator designed to store grain for an extended period of time is quite different from the operation of an elevator designed primarily for the movement of grain. In addition to the equipment and facilities needed to receive and handle grain, a grain storage elevator must include space in which the grain can be kept in good condition for some time. The facilities and equipment and the vertical storage space to receive and

store 250,000 bushels of grain would require an investment of as much as $350,000. To store this much grain, at least 300,000 bushels of space probably would be needed because space must be available for turning operations to keep the grain in condition.

The estimated yearly cost of operating this type of storage elevator could be approximately as follows:

1 foreman-mechanic	$3,000
Labor--1-1/2 man-years	2,700
Repairs and upkeep	750
Power	900
Clerical help	1,200
Maintenance (1 percent of cost of elevator)	3,500
Insurance and taxes	9,200
Total	21,250
Amortization cost	28,084
Total	49,334

The annual amortization cost on an investment of $350,000 is calculated on a 20-year basis, including interest at 5 percent. The income of this elevator would be from grain storage only. It is estimated that a maximum of 15 cents a bushel would be received for grains stored, which would include in and out charges. With 250,000 bushels stored, this would result in a gross income of $37,500, or $11,834 less than the yearly cost of operation and amortization, exclusive of any income for management, an obviously unprofitable enterprise.

These illustrations point out the fact that an elevator primarily designed to receive, handle, and move a given volume of grain has a much lower investment and a much greater chance of profit than an elevator primarily designed to store the same volume of grain. It is a common statement in the grain trade that the opportunities of profit are much greater in the grain handling and movement business than in the grain storage business under prevailing margins, storage rates, and construction charges.

Facilities and Equipment Needed in South Carolina

The following minimum items of equipment are needed at any elevator which receives substantial quantities of grain delivered by farmers.

1. A motortruck scale at least large enough to accommodate a large farm truck. An elevator that will receive bulk grain in semitrailer loads should have a large motortruck scale with a platform at least 50 feet in length with a weighing capacity of at least 30 tons.

2. A grain sampler, a moisture tester, and a weight-per-bushel apparatus for determining the grade and qualities of the grains received and handled.

3. A hoisting device for lifting the front end of a motortruck so that grain will flow from the rear of the truck body by gravity. A hand-operated truck hoist can be used if only farm trucks are to be accommodated. However, if large trucks and semitrailers are to be accommodated, a power-operated platform lift is most useful. In some installations such a platform lift is combined with a scale mechanism, using one platform for both weighing and dumping. This entire operation can be done with maximum speed and efficiency with this combination equipment, but the installation is relatively expensive.

4. A grain dump covered by an appropriate dump grate into which the grain can flow by gravity from trucks. The grain dump should be large enough to hold the largest truckload of grain expected. In the original installation it is wise to install dump pits which might be considered too large at time of installation because the trend is towards larger trucks in grain hauling. Much delay and slowup of operations may be caused by having dump pits that are too small, and a large dump pit can do anything that a small one can

do. In the original installation the cost of a small dump pit will not be much less than the cost of a large one.

A separate dump pit probably will be necessary to receive ear corn because of the size of the grate needed and the required flow of ear corn from the dump pit into the husker-sheller. Openings in the dump grate for small grains should be sufficiently small to catch pieces of iron, rocks, and other foreign materials and to prevent such materials from damaging the equipment farther along in the line of grain flow. The same dump pit and grate can be used for all small grain and shelled corn. The number of dump pits needed will be governed by the kinds of grain to be received at the same time and the expected volumes to be received.

In South Carolina, it is suggested that at least 2 dump pits, 1 for ear corn and 1 for small grains and soybeans are needed in all areas. One of the major bottlenecks observed at elevators was the lack of speed in receiving grain from farmers, who were obliged to wait for hours to unload. Delivery of grain in bags at elevators probably will continue for some time in certain areas, and, if so a separate dump pit, as well as a separate driveway, to accommodate such operations may be advisable.

5. Grain conveyors or drags, either of the gravity or power type, to move the grain from the dump pits to the boot pit at the bottom of the leg. Each dump pit must have a drag and most installations are permanent, with the drag not being moved from the base of one dump pit to another.

6. Elevator legs or vertical conveyors to move grains from the boot pit to higher levels. An elevator receiving both small grains and ear corn will need at least two legs. An elevator leg can handle only one grain at a time, and if more than one small grain is to be received at a time, more than one leg for small grains will be needed. One leg can be fed from several dump pits by separate drags. In elevator operation, one leg of large capacity cannot do the same work as timely as two legs each of half that capacity. The cost of 2 legs of 500 bushels an hour capacity will usually be substantially more than the cost of 1 leg of 1,000 bushels an hour capacity, but the 2 legs will give a flexibility of operations not possible with 1 leg.

7. A cleaner or separator to separate foreign materials, such as straw, dirt, stones, and chaff, from grains. In most good installations the cleaner receives grain directly from the leg head, and the grain flows from the cleaner to the distributor. Foreign materials in grain affect the grade of the grain. A cleaner or separator may quickly pay for itself by eliminating foreign materials and raising the grade of the grain.

8. A distributor to receive grain from the cleaner and direct it to chutes leading to storage bins, motortrucks, or rail cars. Most modern distributors can be controlled manually or by power from the workhouse floor, thus eliminating the need for climbing to the distributor level to manually change the distributor outlet chute.

9. An automatic scale to weigh grain being received or loaded out to rail cars and motortrucks from bins or from the distributor. The weight of grain flowing into the hopper of an automatic scale operates the weighing mechanism and after being weighed the grain moves on, usually by gravity chute. Because of the difficulty of weighing, sampling, and grading ear corn with the husk on, some elevators have installed automatic scales in the flow. Cleaned shelled corn can be sampled and weighed by this method and accurate grade determinations can be made.

10. Grain bins or tanks in which to store grains. The number of bins needed would be determined by the number of different kinds and qualities of grains to be kept on hand at the same time. The capacity of the bins would be determined by the quantities of grains to be kept on hand awaiting shipment from the elevator. Usually the more frequent the outshipments, the less total capacity is needed. In recent years new elevators constructed in the Southeastern States, having small operating storage capacity, have tended to use steel bins rather than concrete. Several elevator operators stated that such steel

bins were cheaper per bushel of space than concrete, especially if local labor was used in installation. All bins should be hopper-bottomed so that they will empty without the use of labor. The grains should flow from the distributor to the bins by gravity.

11. A return conveyor to move grains flowing from bottom of bins to leg boot. This conveyor can be a screw type, in a waterproof straight-in-line casing, with the chutes from the bins entering the top of the casing. The capacity of this screw conveyor and the leg which it feeds will determine the capacity to load out grains from the bins, and the conveyor never should have a greater capacity than the capacity of the leg which it feeds.

The above equipment can be used in the control of insects in grains. No mechanical devices, equipment, or handling methods are known that will repair or regain the losses in quality and the damages caused by insects in grain. Methods are available to prevent possible damage by eliminating or killing off insects in the grain. Fumigation, spraying, or other methods of killing insects may be used when the grain is received, or while it is in storage as it is being turned from one bin to another. The prevalence of insects in grain is so pronounced in South Carolina that provision should be made in an elevator to allow for effective treatment for insect infestation. Extra grain bins may be necessary for efficient turning and treatment. If the grain is kept on hand for any length of time, the treatment may have to be repeated, because most treatments do not kill the insect eggs inside the grain kernels. These eggs may hatch and reinfest the grain.

Whether a grain drier for extracting moisture from grain would be advisable will depend upon the need for it and the opportunity for its use at the individual elevator. A commercial grain drier is expensive. A good commercial drier with a capacity of reducing moisture content 5 percent in 500 bushels of grain per hour cost from $12,000 to $15,000 on the basis of manufacturers' prices in 1954. A large quantity of grain must be dried in a grain drier costing this much for the drier to pay for itself. With good methods of storing grains that are to be fed to livestock on farms, it is highly questionable whether it will ever be advantageous to dry farm-fed grains in an off-farm commercial drier. Storing in well-ventilated cribs and air-drying on farms is apparently reasonably successful in preventing serious moisture damage. Therefore, a commercial drier located at an elevator will find its greatest use only in drying grains that are currently moving in commercial channels. A drier is needed only when the grains are harvested and marketed too wet for safe storage or when the presence of excessive moisture necessitates heavy down-grading in quality. In recent years the incidence of dry weather during the growing and harvesting season has been pronounced in may sections of the State, and the moisture content of marketed grains on the average has been relatively low, with no need for drying in a commercial drier. It is seldom that an expensive piece of equipment, such as a commercial drier, can be paid for by intermittent use. Experience in other States indicates that a drier seldom can pay for itself by being used 1 year out of 5, 3, or even 2 years. The maximum capacity of any drier is limited, and in years when grains are harvested and marketed with high moisture content, the drier seldom can work overtime the number of hours necessary to make up for the hours of idleness in dry years. The economic feasibility of a drier in an elevator doing a grain movement operation must be based primarily upon the assumption that the removal of moisture from the grain will result in an upgrading of the grain and an increase in price. This increase in price must be greater than the cost of the drying plus the amortized cost of the drier.

An elevator that stores grain for some time may have more opportunity to dry enough grain to pay for a commercial drier than an elevator that merely assembles grain and moves it into marketing channels. An elevator storing grain for farmers under the CCC loan program may find that in wet years farmers will find it advantageous to dry their grains so that such grains will qualify under the requirements of the program. A processor of large quantities of grains may need a commercial drier to condition his grains for processing. However, certain processors of grains in South Carolina stated that, generally speaking, with their processing machinery turning out both feed for livestock and food for human consumption, their milling processes were satisfactory if the grain had a considerably higher moisture content than that necessary for safe storage.

The grain milled easier. This stated preference for relatively high moisture grain may remove some of the incentive for a large processor to have a commercial drier, except in years when excessively wet grain is marketed.

A grain drier should be installed as a separate unit completely outside the elevator structure but close enough to the storage bins to be reached easily by gravity chutes and conveyors. Grain is usually fed to a drier from the distributor, and returns by conveyors to the leg boot from which it is returned to the bins. The two most common types of driers are those in which (1) the grain moves downward from the top of the drier, usually by gravity, and (2) the grain moves horizontally on conveyors. No data are available to indicate the comparative advantages and disadvantages of each. Operators of driers stated that height and inaccessibility of vertical driers made cleaning difficult as compared to horizontal driers. Horizontal driers are manufactured in a type of unit that can be moved without great difficulty from one location to another. Vertical driers usually are permanently installed in one location.

In addition to the above items, a well equipped elevator may include other items of equipment, such as (1) one or more magnetic separators for removing metal from the grain as it flows through the equipment. Magnetic separators usually are installed in the first flow of grain, such as the drag from the dump pit to the leg boot in small-grain flow; or at the drag outlet to the husker-sheller in a corn-shelling operation. Such magnetic separators remove iron and steel, such as plow shears, tools, farm machinery parts, and other objects which might go through the dump grate and seriously damage a piece of elevator equipment. (2) Gauges for recording grain temperatures in bins at elevators where grain is stored for considerable time. (3) Man-lifts and stairways for the movement of personnel, equipment, and materials from one level to another. (4) Dust collectors and exhaust fans, greatly needed in an elevator where grains may be turned, cleaned, ground, or otherwise processed. (5) Safety and fire fighting equipment for the prevention of loss and injury to personnel, facilities, and stocks. (6) A railroad grain car dump and rail spur for the receipt and shipment of grain by rail.

The above equipment will facilitate the receiving and moving of grains in an elevator. If an elevator operator contemplates carrying on a custom service business for farmers, the following items of equipment will be needed: (1) A grain grinder or a hammer mill to grind corn, oats, wheat, and other materials, (2) a feed mixer for mixing ground farm-grown grains with high protein feed ingredients usually available at the elevator. There may be room on the elevator workhouse floor for this equipment, but as the business grows it may be advantageous to build a small structure near the elevator to house this type of operation. Some space will be needed to store the feed ingredients. Such a structure should have unloading and loading platforms at truck-bed height, should be easily accessible by truck with ample space for truck maneuvering, and should have ample parking space. If the elevator is located on a railroad siding, this custom service building should be located along the siding with a platform on the railroad side at car-floor height to allow for the convenient use of hand trucks and conveyors.

Problems in Operation

SEASONAL MARKETING OF GRAINS

Marketing of grain is highly seasonal in all areas in South Carolina. The movement of small grains from farms into commercial channels is greatest during June and July. Farmers producing oats and wheat to be sold as cash crops usually sell them during these months. If grains are stored under the CCC loan program, they go into storage mainly during these months. In a like manner farmers producing corn as a cash crop tend to sell it as soon as possible after harvest in October and November. However, a substantial percentage of the corn in South Carolina is produced on farms where it is chiefly used as livestock feed. Such farms may sell some corn during the several months following harvest, when individual farmers decide that the supplies on hand are greater than needed to feed their livestock, or that the current cash value is greater than the value as feed for livestock.

Under such a pattern of grain movement, off-farm facilities in the business of receiving, handling, temporary storing, and shipping grains have a highly seasonal workload. If an elevator is located in an area where corn, oats, wheat, and soybeans are produced in substantial volumes, the workload would vary substantially as follows: Labor and equipment would be operating at maximum capacity during June and July but would taper off sharply in August and September. Corn receipts would start in October and would continue in volume through November. The volume might decline in December, unless there was an unusually large production in the trade area. During January, February, March, and April, corn would continue to move from farms in small quantities, with very little movement of corn into commercial channels after May. Soybeans would move from farms into commercial channels directly after harvest, usually in October.

An operator of an elevator in an area producing both small grains and corn as cash crops would be in a much better situation than an operator in an area that produced only corn and soybeans.

Because grain movement from farms is seasonal, it is quite rare for an elevator to keep busy handling and marketing grain, except during short, peak marketing periods. An elevator that had an opportunity to handle and ship grain at maximum capacity for the equivalent of 90 days out of the year would be very fortunate. Generally speaking, an elevator could move much more grain over a period of 12 months than it could obtain.

SIDELINE OPERATIONS

Because of the part-time and highly seasonal movement of grain from farms, sufficient labor must be employed to care for peak loads. Usually such labor will be most efficient and dependable when hired on a permanent basis. The problem of keeping both labor and management busy in productive work during the off season is one of the most serious problems in elevator management. The most practical solution to this problem is the operation of the elevator in connection with other types of businesses, using the good services performed by the elevator to help attract farmer customers. In South Carolina most of the good elevator units in 1953 were operated in connection with a grain processing business. Some were operated by the management and labor that also operated cotton gins. The peak of ginning usually is passed before corn harvest. Cottonseed cleaning and merchandising comes in the spring months before small-grain harvesting. Buying and selling farm seeds and the addition of a small seed cleaner can also attract farmer customers.

Addition of a hammer mill and feed mixer can be made at a maximum investment of $3,000 or less. Grinding farm-grown grains for farmers on a custom-service basis, with the sale of high-protein feed ingredients to add to the mix, is an enterprise from which considerable income is obtained by elevators that are located in areas in which dairy cattle and hogs are important. Usually this kind of operation leads into the merchandising of mixed feeds, especially if the elevator is located in an area in which commercial poultry and egg production and dairying is carried on to any extent.

Using the hammer mill to grind corncobs for dairy feed mixes or for poultry litter and baling and selling cornhusks may give a profitable outlet for unused labor as well as disposing of these bulky discarded products that otherwise may be operating liabilities. If the location of the individual elevator will allow and if space is available, the feeding of elevator waste to either hogs or cattle has proved advantageous in some instances. Corncobs as they come from the sheller, screenings, dust, and trash from dust collectors and sweepings, weed seeds cleaned from small grains, all have feed values that can be utilized by livestock. Badly damaged and unmerchantable grain may be purchased from farmers at highly discounted prices and fed to elevator-owned hogs. Under methods of storing grains on farms observed in 1953, weevil damage to corn, especially after the advent of warm weather in the spring, was such that much of it was unmerchantable and would not move into commercial channels. Certain dealers stated that in years of wet harvests, moisture damage was severe and much grain moving from farms was unmerchantable, especially if it had been stored on farms under unfavorable conditions for 3 months or longer.

Generally speaking, severely damaged grain, if it can be sold on the grain market, is discounted to a much greater extent than its reduction in feeding value would warrant. Therefore, if a farmer delivers this damaged grain the elevator management can afford to pay an equitable price and utilize the relatively low-cost feed value.

Most country grain elevators in other parts of the United States engage in a wide range of merchandising in order to get maximum labor utilization. In hundreds of instances, the supplemental merchandising business has grown to such an extent that it completely overshadows the grain elevator business, both in income and in labor utilization.

It should be pointed out, however, that elevators in South Carolina should approach the sideline merchandising business with caution. Elevators in the Corn Belt carrying on large volumes of sideline merchandising usually have been operating in their respective areas for many decades and were usually the pioneers, so to speak, in the development of their particular sidelines in their respective communities. As buyers of merchandise, farmers were being fairly well served in South Carolina in 1953 by firms already operating in the respective elevator areas. Therefore, the opportunities for handling sideline merchandise as a supplemental operation in conjunction with a new elevator enterprise are not nearly as attractive as they were years ago. Competition from existing firms in that line of business would be keen. The greatest opportunities available to the management of a local grain elevator would be centered around services to farmers in the production, harvesting, and processing of grains and seeds, and the feeding of grains to livestock. Selling seeds, providing harvesting services, grain drying on and off farms, buying all grain and seeds, grinding and mixing feeds and providing high protein feed ingredients, selling high quality mixed feed either elevator mixed or purchased, selling equipment needed on farms to do a good job in feeding, all should be considered as possibilities. If the farmers request improved fertilizer services, or wish to have other farm supplies more readily available, such ventures should be investigated.

QUALITY OF MANAGEMENT

Experience indicates that, in the competitive field of grain marketing for farmers, the quality of management is the most important single factor in the successful operation of a country elevator. In many instances good management can overcome some of the handicap of relatively poor facilities, but no case is known where good management has overcome the complete lack of efficient facilities. No method is known whereby a country grain buyer can operate successfully under competitive margins without having mechanical equipment to replace hired labor in grain receiving, handling, storing, and shipping.

COMPETITION OF DISTANT MARKETS

When highways were not good and transportation was slow, the farmer was distinctly limited in the number of outlets for the sale of his grains. Unless he could sell the grain locally to a mill or other assembler, he usually could not sell it at all. Local buyers essentially had a monopoly. However, the development of good highways and fast methods of transportation has greatly enlarged the area in which a farmer may seek a buyer. A haul of 50 miles on good roads in a good truck may take much less time and effort than a haul of 5 miles over bad roads with a wagon and mules years ago. Therefore, the time has essentially passed when an elevator or other assembly station could automatically acquire the grain business of a given area because no other local buyer was available. In some respects each grain buyer in South Carolina is competing with all other buyers. This is particularly true as it concerns the producer of larger volumes of surplus grains. The larger the load of grain the farther the farmer can afford to haul it to get an equitable price and good service. A farmer can afford to move 600 bushels of wheat a long distance in a transport truck in order to benefit from a price higher than his local market price. The farmer with a small load of 25 bushels could not take advantage of these distant markets and their possible higher prices since the per bushel hauling costs in small loads would be too great.

From the standpoint of elevator operation, the larger the load of bulk grain received the less the cost per bushel of receiving and handling, assuming that the facilities are reasonably good. The same process is followed whether 25-bushel or 600-bushel loads are received. The only difference in the two transactions would be in the time of mechanical operation of machinery. Weighing, testing for quality, paper work, weighing out, and all such actions would be similar. Large lot business is usually at the lowest cost per bushel, and the local elevator should have merchandising practices and handling methods to attract such business; otherwise this business will move to elevators giving better services and more equitable dealings. In 1952 some farmers hauled large loads of grain as far as 200 miles to reach good elevators that had reputations for giving good service and for paying equitable prices.

DETERMINING QUALITY AND QUANTITY OF GRAIN MARKETED

At many buying points grain is bought without regard to the possible variation in quality and condition of individual lots. Grain damaged by weevils is usually sold at the same price as undamaged grain. Grain with substantial content of chaff, dirt, and rodent and bird excreta is sold at the same price as uncontaminated and clean grain. Low moisture grain is sold at the same price as higher moisture grain--provided the moisture is not so high as to be noticeable by hand examination.

Field observation brought to light no consistently used method for accurately determining the quantity of corn being marketed. Small grains, either in bags or bulk, were weighed by truck scales or platform scales, and net weights were determined with reasonable accuracy. Ear corn, however, was delivered with a partial or a complete husk, in bulk in a truck or trailer. The net weight of ear corn with husk can be accurately determined by truck scales. From that point on, however, any determination as to the quantity of shelled corn that will be obtained from the lot is essentially based upon experienced guessing. Limited examination of ear corn from loaded trucks at receiving points indicates that individual loads yielded 56 pounds of grain from 76 to 88 pounds of ear corn in the husk as weighed on the scales. Growing conditions, method of harvesting, variety, moisture content, and damage by weevils, all have a material effect upon the quantity of shelled corn obtained from a lot of ear corn. Certain dealers stated that within their experience corn marketed with a heavy husk and short ears in the late spring after months of weevil infestation required as much as 100 pounds to shell out 56 pounds of grain. Seldom was less than 76 pounds needed, and these were well filled out ears of large, uniform size, well dried in the field, and marketed with a partial husk before any insect damage took place. With a possible variation from 76 pounds to 100 pounds to yield 56 pounds of shelled corn, it can be concluded that any one lot of corn may have as much as one-third variation in determination of its volume in bushels, the basis of price quotations.

The individual farmer stands to lose because of the lack of reasonably accurate quality determinations in all grains and of specific quantity determinations in corn. From experience the grain buyer knows that he cannot guess consistently in the farmer's favor and make a profit. Experience has shown that, to be assured of profits, the buyer cannot ignore any item indicating poor quality. This tends to result in the attitude that all grain is in poor condition one way or another unless it is proved good. Usually little or no equipment is in use to prove the grain good or poor. Even if the average of all grains purchased is accurate as to quality and quantity, the farmer marketing top quality often does not receive a better price than the farmer marketing low quality. Generally speaking, good quality corn shells out better than poor quality corn, and therefore the farmer selling good corn is penalized in both quality and weight determinations. Under this system of penalizing the good quality for the benefit of the poor quality, a farmer has no incentive to produce, care for, and market good quality corn. If good quality grains sell for no more than poor quality grains why go to the trouble and extra expense of producing and caring for good quality grains.

There is a standard procedure that is reasonably effective in determining quality and quantity of grains. Quality and quantity are affected chiefly by (1) moisture content, (2) test weight per cubic bushel, (3) amount of damage to kernels, and (4) amounts of foreign materials in the grain. The amount of moisture in the kernels can be determined by standard moisture testers. The test weight per bushel is determined by apparatus designed for this purpose. The amount of damage to kernels can be determined by a physical examination of the kernels, and the amount of foreign materials can be determined with the use of screens and various sifting devices. By the use of these methods of determining grain quality, a standard system of quality determinations universally applicable to all areas of the country has been developed, whereby classes and grades of grains of the same recognized quality have the same class and grade names.

Quality determinations of corn are made after the corn is shelled. No system is known that can make good quality determinations while the kernels are still on the cob. Experience indicates that obtaining representative samples of ear corn from loaded trucks is practically impossible without the use of much labor. The time and labor necessary to shuck the ears, shell the corn (usually by hand or hand sheller), and make a grade or quality determination make this process impractical, even if a representative sample could be obtained.

Accurate determinations of the quantity in a load of ear corn in the husk also cannot be made while the corn is on the ear. The quantity determination could be made from the same sample from which the quality determination is made, but it is subject to the same difficulties. After a good sample is obtained it must be weighed as it comes from the truck; after the corn is shelled the weight of the shelled corn in relation to the ear and husk weight would give a shelling-out ratio to be applied to the entire lot. This is such a laborious process that it would be impractical at an elevator.

Field experience indicates that one of the most practical solutions to this problem is to (1) obtain samples of shelled corn for quality examination from the flow of grain as it moves from the husker-sheller, and (2) weigh out the shelled corn in an automatic scale to determine the volume. The automatic scale is installed in the flow of shelled corn from the sheller to storage bins at a convenient point where scale readings can be observed readily by the farmers and grain buyers. The performance and accuracy of such automatic scales would be subject to inspection and certification by authorized public agencies to promote equitable transactions between buyer and seller.

This method of securing good samples and accurate quantity determinations requires relatively high-capacity receiving equipment in order to be practical for the grain buyer and to give prompt service to farmers. In heavy marketing periods low-capacity receiving equipment requires farmers to wait many hours for their turn to unload. However, under the present system, after he unloads, the sale can be completed and the farmer can leave. The proposed method would require that he wait until all his corn is shelled and is weighed on the automatic scales before the sale can be completed. Therefore, the higher capacity receiving and shelling equipment is a requisite. If the capacity of dump pit, drag, and husker-sheller were 600 bushels an hour in normal operations, a farmer with a large load of 200 bushels of corn (shelled basis) could be serviced in 20 minutes. During the season of heavy marketing, 6,000 bushels could be received in a 10-hour day. In contrast, with receiving and husker-sheller capacity at 100 bushels an hour, a 200-bushel load would require 2 hours to receive, and only 1,000 bushels could be received in a 10-hour day.

Obviously, the high-capacity receiving equipment is needed, whether the accurate system of sampling and weighing is used or not. The use of the suggested system of sampling and weighing would require little additional time to operate above the time determined by the capacity of the receiving and shelling equipment. It is possible that with accurate quality and grade determinations being made, additional holding and working bins would be needed to allow for separation of the qualities and grades of grains received. The segregation of grades would allow for accurate blending to give the maximum possible upgrading of grain as it is sold by the elevator. This is a legitimate

practice of elevators handling large volumes of grains of various qualities bought and sold by grades.

BENEFITS OF AN EFFICIENT GRAIN MARKETING SYSTEM

Correction of the major deficiencies in grain marketing facilities, both on-farm and off-farm, requires substantial investments in facilities and equipment. The benefits of the improvements must be more than the costs of making them or no point is served.

The greatest single economic loss in the grain business in the State is caused by the lack of adequate care of grains stored on farms. As shown previously, at the level of 1952 production, about 42 million bushels of storage space would be needed on farms to store the ear corn, oats, and wheat remaining on farms 1 month or longer. It is also estimated that in 1953 a maximum of 6 million bushels of grains could be cared for in reasonably adequate facilities, and that 36 million bushels of additional space was needed. Facilities to provide this space would cost about 30 cents for each bushel of space. The total cost of such facilities, therefore, would be $10.8 million. Accurate data on the damage caused by insect infestation, excess moisture, rodents, and other causes are not available, but it is estimated that the damage to grain stored 1 month or longer lowers the market value 15 cents a bushel. About 22 million bushels of grains (including ear corn on a shelled basis) could be stored and cared for in the 36 million bushels of space. The benefits, therefore, would equal $3.3 million each year. In other words, when correctly used, the facilities costing an estimated $10.8 million could prevent a loss of $3.3 million in value of grains each year and would pay for themselves in less than 4 years.

In 1952 about 21 million bushels of oats and wheat were harvested, at least half of which were harvested with combines having bag attachments. It is estimated that the labor requirements for harvesting a bushel of small grains using bag combines are 2 to 3 times the labor requirements for harvesting a bushel of grain using combines with bulk attachments. The monetary value of the labor saved in using bulk attachments on combines cannot be accurately evaluated, but the saving would be substantial because small-grain harvesting comes at a time when farm labor is needed on other farm enterprises. However, it is estimated that the bags needed to hold the estimated 10.5 million bushels of small grains cost about 5 cents for each bushel of grain bagged. The elimination of this practice by using bulk harvesting and handling would mean a saving of around $525,000 each year. Whether the farmer buys the bags or the grain dealer furnishes them does not alter the fact that in the long run the cost is borne by the farmer in one way or another.

If farmers have good storage facilities on their farms, they can market their grains during months when prices seem most advantageous. A total of 12,860,000 bushels of all grains from the 1952 crops moved from farms. It is estimated that 10 million bushels of grain were produced on farms financially able to postpone the cash sale of such grains for a few months, providing good storage facilities were available on those farms. Seasonal variations in all grain prices are quite pronounced, with the most rapid advances usually occurring in prices for oats and corn. Local prices for oats in 1953 in certain areas advanced from a low of 55 or 60 cents a bushel during harvest season to as much as 90 cents a bushel 3 months later. In many years, local cash prices for corn advance as much as 25 cents a bushel from December 1 to May 1. It is estimated that if such grains were stored on the farms and marketed after the low-price season, the sale prices would increase an average of at least 15 cents in most years. This increase would result in a cash benefit of $1.5 million on the 10 million bushels that could be marketed in this manner. Additional storage space for this grain would cost approximately $3 million. With this additional space, farmers could participate in the CCC grain storage loan programs in years when the spread between local cash prices and CCC loan prices was great enough to pay them to do so.

Improvements recommended in off-farm receiving, handling, storage, and shipping facilities and equipment will benefit both the farmers and the grain buyers making such improvements. To stay in business, grain dealers using inefficient and high-cost methods of receiving and handling grains must have wide margins. In the long run, the farmer pays for most of such margins in lower prices received. In local areas in the State, grain buyers stated that margins of 35 to 50 cents a bushel were necessary to support the high labor costs and inefficient facilities and methods used by many grain buyers. Data obtained from country elevator operators in Indiana indicated that, by using highly efficient equipment and methods, the average margin of those elevators for receiving, handling, and loading out grains was from 6 to 10 cents a bushel. There are no significant circumstances in grain marketing in South Carolina which indicate that grain buyers with efficient facilities and practices cannot also approach such small margins eventually. The lowering of buyers' margins as much as 15 cents a bushel--perhaps from 30 cents to 15 cents--would result in benefits of $1.5 million in selling 10 million bushels of grain. The new facilities and equipment would require substantial investment at many elevators. However, it is estimated that 23 out of the 86 dealers were carrying on their operations with good to excellent facilities, most of which required only minor improvements. As these efficient operators compete with each other on an equitable basis, margins will gradually decrease, and all buyers will be obliged to have low-cost operations to remain in business.

Benefits from the use of accurate weight determinations in marketing corn are difficult to estimate. Under the present system it is probable that the farmer selling ear corn yielding a high percentage of shelled corn loses, and that the farmer selling ear corn yielding a low percentage of shelled corn benefits, assuming that the buyer pays the same price to both. However, the factors used in current methods of determining volumes of corn delivered usually are prescribed by the buyer, and the farmer is in a poor bargaining position with respect to any possible inequities in the methods. These current methods in themselves do not increase the marketing costs, but they allow for inequities in the distribution of such costs between sellers and buyers of grain.

Total benefits to farmers and off-farm buyers of grains by the use of accurate quality determinations are essentially in this same category. If the farmer who markets high quality grain is paid the same price per bushel as the farmer who markets low-quality grain, the farmer selling the high-quality grain loses and the other farmer benefits. With the buyers establishing price levels based upon factors unknown to the farmers, however, the farmers are in a poor bargaining position. The use of grain quality and grade determinations in buying grain from farmers increases buyers' costs very little. The mutual confidence associated with such methods, however, tends to benefit both farmers and grain buyers. Buyers also find that if they know the quality of the grains they buy, they can benefit by selling them or processing them more advantageously.

APPENDIX

TABLE 3.--Production of principal grain crops in South Carolina, 1940-54[1]

Year	Corn	Oats	Wheat	Barley	Rye	Milo	Soybeans
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
1940.....	25,491	11,902	2,834	228	171	--	72
1941.....	22,316	13,317	3,294	420	230	--	75
1942.....	21,330	14,190	3,450	630	261	--	96
1943.....	26,218	15,341	2,808	630	153	--	104
1944.....	25,519	18,099	3,668	578	166	16	112
1945.....	24,123	18,200	2,828	441	142	17	70
1946.....	26,770	18,753	2,574	520	110	56	240
1947.....	27,378	17,952	3,812	572	115	78	270
1948.....	27,651	11,250	2,940	387	60	122	360
1949.....	28,782	14,822	1,992	405	57	126	500
1950.....	31,089	17,792	1,974	340	60	152	744
1951.....	26,320	16,128	3,300	400	75	74	1,038
1952.....	18,945	17,460	3,680	486	80	66	1,127
1953.....	23,146	21,385	3,636	468	143	99	1,430
1954.....	11,718	23,846	3,081	522	184	62	910

[1] Federal-State Crop Reporting Service.

TABLE 4.—Corn and oats: Production, farm utilization, and movement from farms, 1952 crop

County	Production[1]		Used on farms[2]		Moved from farms[3]	
	Corn	Oats	Corn	Oats	Corn	Oats
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Abbeville	125	200	113	164	12	36
Anderson	480	1,400	360	800	120	600
Cherokee	190	200	173	170	17	30
Chester	210	350	194	290	16	60
Edgefield	225	300	191	238	34	62
Fairfield	150	330	135	260	15	70
Greenville	420	600	336	425	84	175
Greenwood	100	120	95	110	5	10
Lancaster	230	200	214	164	16	36
Laurens	260	550	208	432	52	118
McCormick	60	110	57	101	3	9
Newberry	260	550	156	268	104	282
Oconee	265	350	239	305	26	45
Pickens	285	300	228	213	57	87
Saluda	250	340	125	137	125	203
Spartanburg	600	760	420	435	180	325
Union	130	110	120	95	10	15
York	360	445	335	393	25	52
Aiken	486	420	413	315	73	105
Chesterfield	406	370	365	292	41	78
Kershaw	270	500	230	380	40	120
Lexington	322	470	209	270	113	200
Richland	382	440	229	215	153	225
Clarendon	624	430	562	376	62	54
Darlington	602	470	361	230	241	240
Lee	241	750	193	559	48	191
Marlboro	328	600	197	300	131	300
Sumter	476	590	428	490	48	100
Allendale	258	470	206	230	52	240
Bamberg	427	380	363	250	64	130
Barnwell	556	410	417	235	139	175
Calhoun	332	530	282	395	50	135
Hampton	348	380	313	282	35	98
Orangeburg	1,139	1,120	1,025	930	114	190
Dillon	615	330	431	190	184	140
Florence	1,551	600	931	275	620	325
Horry	1,265	300	1,115	250	150	50
Marion	462	235	393	135	69	100
Williamsburg	868	90	825	82	43	8
Beaufort	189	30	180	27	9	3
Berkeley	421	50	400	45	21	5
Charleston	102	15	97	14	5	1
Colleton	826	200	743	149	83	51
Dorchester	494	30	420	27	74	3
Georgetown	186	25	177	23	9	2
Jasper	169	10	161	9	8	1
State	18,945	17,460	15,365	11,975	3,580	5,485

[1] Calculated from Crop Reporting Service district estimates.
[2] Calculated from on-farm livestock feed requirements and data from individual county sources.
[3] Production less amount used on farms.

TABLE 5.--Wheat and soybeans: Production, farm utilization, and movement from farms, 1952 crop

County	Production		Used on farms		Moved from farms[5]	
	Wheat[1]	Soybeans[2]	Wheat[3]	Soybeans[4]	Wheat	Soybeans
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Abbeville	107	--	32	--	75	--
Anderson	670	2	100	--	570	2
Cherokee	101	1	30	--	71	1
Chester	27	2	20	--	7	2
Edgefield	40	102	20	10	20	92
Fairfield	16	--	16	--	--	--
Greenville	226	2	45	--	181	2
Greenwood	53	--	27	--	26	--
Lancaster	72	1	28	--	44	1
Laurens	256	1	51	--	205	1
McCormick	4	--	4	--	--	--
Newberry	151	8	30	1	121	7
Oconee	92	1	28	--	64	1
Pickens	91	6	27	1	64	5
Saluda	72	24	22	2	50	22
Spartanburg	370	6	74	--	296	6
Union	61	1	31	--	30	1
York	76	4	46	1	30	3
Aiken	62	73	31	8	31	65
Chesterfield	101	29	40	3	61	26
Kershaw	49	9	29	1	20	8
Lexington	56	25	28	2	28	23
Richland	78	40	23	4	55	36
Clarendon	19	5	19	1	--	4
Darlington	220	30	55	2	165	28
Lee	74	51	30	6	44	45
Marlboro	55	48	22	5	33	43
Sumter	64	25	19	3	45	22
Allendale	26	25	13	3	13	22
Bamberg	36	7	18	1	18	6
Barnwell	25	5	13	1	12	4
Calhoun	108	342	22	35	86	307
Hampton	2	93	2	9	--	84
Orangeburg	44	112	22	11	22	101
Dillon	41	2	21	1	20	1
Florence	79	4	24	1	55	3
Horry	8	3	8	--	--	3
Marion	14	1	14	--	--	1
Williamsburg	21	3	21	--	--	3
Beaufort	--	12	--	1	--	11
Berkeley	2	1	2	--	--	1
Charleston	2	7	2	1	--	6
Colleton	3	10	3	1	--	9
Dorchester	--	--	--	--	--	--
Georgetown	6	--	6	--	--	--
Jasper	--	4	--	--	--	4
State	3,680	1,127	1,118	115	2,562	1,012

[1] Federal-State Crop Reporting Service.
[2] Calculated from Crop Reporting Service district estimates.
[3] Calculated from livestock feed requirements and estimates from county sources.
[4] Mainly saved for seed.
[5] Production less quantities used on farms.

TABLE 6.--Total grain production, farm utilization, and movement from farms, 1952 crop[1]

County	Production	Used on farms	Moved from farms
	1,000 bushels	*1,000 bushels*	*1,000 bushels*
Abbeville	445	322	123
Anderson	2,707	1,315	1,392
Cherokee	522	393	129
Chester	596	511	85
Edgefield	673	465	208
Fairfield	499	414	85
Greenville	1,293	834	459
Greenwood	285	244	41
Lancaster	508	411	97
Laurens	1,171	766	405
McCormick	176	164	12
Newberry	1,029	502	527
Oconee	721	585	136
Pickens	707	492	215
Saluda	720	312	408
Spartanburg	1,786	964	822
Union	308	252	56
York	908	794	114
Aiken	1,044	770	274
Chesterfield	929	710	219
Kershaw	828	640	188
Lexington	876	512	364
Richland	964	485	479
Clarendon	1,078	958	120
Darlington	1,325	651	674
Lee	1,123	795	328
Marlboro	1,034	527	507
Sumter	1,156	941	215
Allendale	780	453	327
Bamberg	852	634	218
Barnwell	997	666	331
Calhoun	1,314	735	579
Hampton	827	610	217
Orangeburg	2,418	1,991	427
Dillon	990	645	345
Florence	2,238	1,235	1,003
Horry	1,576	1,373	203
Marion	712	542	170
Williamsburg	982	928	54
Beaufort	231	208	23
Berkeley	474	447	27
Charleston	133	121	12
Dorchester	524	447	77
Colleton	1,039	896	143
Georgetown	217	206	11
Jasper	183	170	13
State	41,898	29,036	12,862

[1] Includes small quantities of barley, rye, and grain sorghums.

TABLE 7.--Calculated grain feed requirements in terms of corn equivalent by type of livestock on farms fed from 1952 grain crops

County	Dairy cattle	Other cattle	Hogs	Workstock	Poultry[1]	Total
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Abbeville	163	26	53	64	114	420
Anderson	477	53	145	162	348	1,185
Cherokee	183	20	65	80	274	622
Chester	320	19	47	70	98	554
Edgefield	148	19	118	60	80	425
Fairfield	200	46	60	50	82	438
Greenville	354	18	107	140	358	977
Greenwood	185	38	75	47	80	425
Lancaster	160	13	79	68	173	493
Laurens	269	35	130	99	166	699
McCormick	70	12	31	34	45	192
Newberry	274	27	192	68	248	809
Oconee	237	15	119	96	169	636
Pickens	200	10	83	84	198	575
Saluda	199	24	128	70	208	629
Spartanburg	412	32	152	177	375	1,148
Union	135	18	50	55	98	356
York	312	31	95	120	959	1,517
Aiken	167	28	396	97	161	849
Chesterfield	143	19	232	117	275	786
Kershaw	191	23	170	80	118	582
Lexington	161	16	223	78	257	735
Richland	213	28	266	60	181	748
Clarendon	144	14	649	139	148	1,094
Darlington	95	11	258	133	171	668
Lee	79	8	261	92	101	541
Marlboro	76	20	181	88	91	456
Sumter	150	22	425	129	229	955
Allendale	32	9	187	33	33	294
Bamberg	137	9	350	58	125	679
Barnwell	78	10	361	76	88	613
Calhoun	79	21	400	61	87	648
Hampton	81	15	323	42	72	533
Orangeburg	415	44	1,198	222	424	2,303
Dillon	77	9	331	116	130	663
Florence	178	13	556	216	274	1,237
Horry	121	12	720	224	437	1,514
Marion	75	13	307	100	115	610
Williamsburg	198	31	636	185	216	1,266
Beaufort	105	38	113	39	88	383
Berkeley	137	29	435	75	92	768
Charleston	60	32	149	36	70	347
Colleton	137	57	548	87	166	995
Dorchester	126	17	302	64	80	589
Georgetown	54	10	244	39	142	489
Jasper	55	11	164	28	80	338
State	7,862	1,025	12,114	4,258	8,524	33,783

[1] Includes turkeys.

TABLE 8.--Calculated grain feed requirements, feed grains produced, and feeds purchased by farmers in terms of corn equivalent, 1952

County	Livestock grain feed requirements	Feed grains produced	Feeds purchased
	1,000 bushels	*1,000 bushels*	*1,000 bushels*
Abbeville	420	295	84
Anderson	1,185	1,597	328
Cherokee	622	373	260
Chester	554	456	178
Edgefield	425	440	81
Fairfield	438	376	136
Greenville	977	884	381
Greenwood	425	213	181
Lancaster	493	391	118
Laurens	699	750	162
McCormick	192	135	44
Newberry	809	692	521
Oconee	636	525	156
Pickens	575	525	224
Saluda	629	518	522
Spartanburg	1,148	1,200	481
Union	356	237	89
York	1,517	707	806
Aiken	849	783	251
Chesterfield	786	702	185
Kershaw	582	613	161
Lexington	735	649	399
Richland	748	705	416
Clarendon	1,094	913	129
Darlington	668	957	204
Lee	541	748	55
Marlboro	456	730	111
Sumter	955	867	254
Allendale	294	567	36
Bamberg	679	686	188
Barnwell	613	826	100
Calhoun	648	687	166
Hampton	533	592	79
Orangeburg	2,303	1,865	776
Dillon	663	845	126
Florence	1,237	1,955	256
Horry	1,514	1,462	278
Marion	610	524	151
Williamsburg	1,266	946	129
Beaufort	383	208	94
Berkeley	768	454	110
Charleston	347	119	122
Colleton	995	954	220
Dorchester	589	513	174
Georgetown	489	208	180
Jasper	338	175	136
State	33,783	31,667	10,238

TABLE 9.--Corn, oats, wheat, soybeans, and barley purchased by grain buyers from farmers and from grain dealers, by counties, 1952 crop

County	From farmers						From dealers				Total[1]
	Corn	Oats	Wheat	Soybeans	Barley	Total[1]	Corn	Oats	Wheat	Total[1]	
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Abbeville	1	10	--	--	--	11	--	--	--	--	11
Anderson	58	61	324	4	12	459	229	--	--	229	688
Edgefield	10	100	50	--	--	160	--	--	--	--	160
Fairfield	2	10	--	--	--	12	--	--	--	--	12
Greenville	69	32	99	--	3	203	13	--	--	13	216
Greenwood	40	2	76	--	--	118	60	--	50	110	228
Lancaster	15	100	10	--	--	125	60	--	--	60	185
Laurens	50	100	50	--	--	200	125	--	--	150	350
Newberry	58	72	50	--	15	196	60	--	--	60	256
Oconee	105	50	140	--	--	299	--	--	--	--	299
Pickens	--	10	64	--	--	74	165	--	--	165	239
Saluda	6	11	1	--	--	18	--	--	--	--	18
Spartanburg	346	256	282	--	19	911	574	300	--	874	1,785
York	--	10	--	--	--	10	--	90	--	90	100
Aiken	125	4	--	--	--	129	2	--	--	2	131
Chesterfield	7	70	60	--	--	138	38	20	--	63	201
Lexington	170	50	22	--	--	242	145	--	40	185	427
Richland	30	107	185	115	--	437	77	5	30	112	549
Darlington	10	30	20	--	--	60	--	--	--	--	60
Lee	125	60	100	10	--	295	--	--	--	--	295
Marlboro	8	40	4	1	6	59	4	--	--	4	63
Sumter	80	160	58	41	5	344	135	50	--	185	529
Allendale	15	--	--	120	--	135	10	--	--	10	145
Calhoun	10	64	4	188	--	266	42	--	--	42	308
Hampton	20	198	--	350	--	568	--	--	--	--	568
Orangeburg	100	118	12	40	--	270	--	--	--	--	270
Dillon	12	30	25	--	--	67	--	--	--	--	67
Florence	62	40	85	--	--	187	--	--	--	--	187
Horry	49	--	--	--	--	49	--	--	--	--	49
Marion	5	--	--	--	--	5	--	--	--	--	5
Williamsburg	15	--	5	--	--	20	--	--	--	--	20
Colleton	10	4	--	--	--	14	--	--	--	--	14
State	1,613	1,799	1,726	869	60	6,081	1,739	465	120	2,354	8,435

[1] Includes corn, oats, wheat, soybeans, barley, and small quantities of milo.

TABLE 10.--Corn, oats, wheat, soybeans, and total grains sold by grain buyers to farmers and grain dealers, 1952 crop

County	To farmers					To dealers					Total[2]
	Corn	Oats	Wheat[1]	Soybeans[1]	Total[2]	Corn	Oats	Wheat	Soybeans	Total[2]	
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Abbeville	1	10	--	--	11	--	--	--	--	--	11
Anderson	62	40	--	--	109	150	7	224	4	385	494
Greenville	--	5	--	--	5	--	--	--	--	--	5
Greenwood	--	1	2	--	3	--	--	--	--	--	3
Lancaster	--	70	--	--	70	65	20	6	--	91	161
Oconee	--	15	--	--	15	--	--	60	--	60	75
Pickens	45	--	--	--	45	--	2	45	--	47	92
Saluda	--	1	--	--	1	--	--	--	--	--	1
Spartanburg	6	8	--	--	14	3	8	69	--	80	94
York	--	100	--	--	100	--	--	--	--	--	100
Aiken	2	4	--	--	6	100	--	--	--	100	106
Lexington	--	--	--	--	--	70	--	--	--	70	70
Richland	52	112	--	5	170	--	--	--	110	110	280
Chesterfield	--	75	--	--	75	--	10	30	--	40	115
Darlington	4	--	--	--	4	--	15	20	--	35	39
Lee	--	30	--	--	30	105	30	60	10	205	235
Marlboro	--	--	--	--	--	4	20	2	1	27	27
Sumter	23	110	10	10	154	--	--	12	31	43	197
Calhoun	--	--	--	2	2	2	62	2	186	252	254
Allendale	--	--	--	--	--	--	--	--	120	120	120
Hampton	--	18	--	--	18	20	180	--	350	550	568
Orangeburg	13	18	--	--	31	84	99	11	40	234	265
Dillon	--	--	--	--	--	10	30	25	--	65	65
Florence	--	--	--	--	--	52	40	80	--	172	172
Horry	--	--	--	--	--	29	--	--	--	29	29
Williamsburg	--	--	--	--	--	10	--	4	--	14	14
Newberry	--	--	--	--	--	--	--	17	--	17	17
State	208	617	12	17	863	704	523	667	852	2,746	3,609

[1] Sold to farmers primarily for seed purposes.
[2] Includes corn, oats, wheat, soybeans, barley, and small quantities of milo.

TABLE 11.--Good to excellent[1] bulk grain storage space at mills and elevators, 1953[2]

County	Capacity	County	Capacity
	1,000 bushels		*1,000 bushels*
Anderson	246	Lexington	2
Edgefield	60	Richland	135
Greenville	45	Darlington	26
Greenwood	70	Lee	50
Lancaster	8	Sumter	60
Laurens	40	Allendale	18
Newberry	160	Calhoun	15
Oconee	45	Hampton	385
Pickens	258	Florence	200
Spartanburg	452		
Aiken	25	State	2,370
Chesterfield	70		

[1] For the care of grains.
[2] All vertical storage except in one large elevator.

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